SEQUENCE LISTING

<110> Helgeson, John P.
       Austin-Phillips, Sandra
       Naess, Sara Kristine
       Song, Junqi
       Jiang, Jiming
       Bradeen, James Mathew
       Buell, C. Robin

<120> POTATO GENES FOR RESISTANCE TO LATE BLIGHT

<130> WARF-0235

<150> US 60/439,376
<151> 2003-01-10

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<170> PatentIn version 3.2

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ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa      96
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
            20                  25                  30

agg ctt tca agc atg ttt tct aca atc caa gcc gtc ctt gaa gat gct     144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
        35                  40                  45

caa gag aag caa ctc aac gac aag cct cta gaa aat tgg ttg caa aaa     192
Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys
    50                  55                  60

ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa     240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
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act aag gcc aca aga ttc ttg cag tct gaa tat ggc cgt tat cat cca     288
Thr Lys Ala Thr Arg Phe Leu Gln Ser Glu Tyr Gly Arg Tyr His Pro
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aag gtt atc cct ttc cgc cac aag gtt ggg aaa agg atg gat caa gtg     336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
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atg aaa aaa ctg aat gca wtt gct gag gaa cga aag aag ttt cat ttg     384
Met Lys Lys Leu Asn Ala Xaa Ala Glu Glu Arg Lys Lys Phe His Leu
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caa gaa aag att ata gag aga caa gct gct aca cgg gaa aca ggt tct     432
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Page 1

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gtc ctc cca ata ctt ggt atg ggg gga cta gga aag acg act ctt tcc        576
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caa atg gtc ttc aat gat cag aga gta act gag cgt ttc tat ccc aaa        624
Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu Arg Phe Tyr Pro Lys
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gca ata gta gaa tct att gaa ggg aag tcc ctc agt gac atg gac ttg        720
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gct cca ctt caa aag aag ctt caa gag ttg ctg aat gga aaa aga tac        768
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                260                  265                  270

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cca tat gaa ttg tca aat ctg tct cca gag gat tgt tgg ttt ttg ttc        960
Pro Tyr Glu Leu Ser Asn Leu Ser Pro Glu Asp Cys Trp Phe Leu Phe
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atg cag cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt atg       1008
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gca atc gga aag gag att gtg aaa aaa tgt ggt ggt gtg cct cta gca       1056
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gcc aag act ctt gga ggt att ttg cgc ttc aag aga gaa gaa aga gaa       1104
Ala Lys Thr Leu Gly Gly Ile Leu Arg Phe Lys Arg Glu Glu Arg Glu
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agt tct att ctg cct gcc ctg agg ctt agt tac cat cat ctt cca ctt       1200
Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
385                  390                  395                  400

gat ttg aga caa tgc ttt gtg tat tgt gcg gta ttc ccg aag gac acc       1248
Asp Leu Arg Gln Cys Phe Val Tyr Cys Ala Val Phe Pro Lys Asp Thr
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aaa atg gca aag gaa aat ctt atc gct ttc tgg atg gca cac ggt ttt       1296
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tgg aat gaa tta tac ttg agg tct ttc ttc caa gag att gaa gtt gaa      1392
Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Glu
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tct ggt aaa act tat ttc aag atg cat gac ctc atc cat gat ttg gct      1440
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465                 470                 475                 480

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aat gct aat tat gat gga tat atg atg tcg att ggt ttt gct gaa gtg      1536
Asn Ala Asn Tyr Asp Gly Tyr Met Met Ser Ile Gly Phe Ala Glu Val
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Val Ser Ser Tyr Ser Pro Ser Leu Leu Gln Lys Phe Val Ser Leu Arg
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Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile
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att cgt aat ctt cca aag aga tta tgc aag ctt caa aat ctg cag act      1728
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ctt gat cta cat tat tgc gac tct ctt tct tgt ttg cca aaa caa aca      1776
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aca tca acg cca cca agg ata gga ttg ttg aca tgc ctt aag tct cta      1872
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agt tgc ttt gtt att ggc aag aga aaa ggt cat caa ctt ggt gaa cta      1920
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gtg aag aaa gat acg gat gca aaa gaa gct aat tta tct gct aaa gca      2016
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tat gat tca gaa gtt ctt gaa gcc ctc aaa cca cac tcc aat ctg aaa      2112
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785             790                  795                  800

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att ccg acc ctt tct tct gtc aag aca ttg aaa gtt att gtg aca gat     2496
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gca aca gtt ttg agg tcc ata tct aat ctt agg gct ctt act tct ctc     2544
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            835                  840                  845

gac att agc gat aac gta gaa gct act tca ctc cca gaa gag atg ttc     2592
Asp Ile Ser Asp Asn Val Glu Ala Thr Ser Leu Pro Glu Glu Met Phe
    850                  855                  860

aaa agc ctt gca aat ctc aaa tac ttg aaa atc tct ttc ttt agg aat     2640
Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys Ile Ser Phe Phe Arg Asn
865                  870                  875                  880

ctc aaa gag ttg cct acc agc ttg gct agt ctc aat gct ttg aag agc     2688
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ctc aaa ttt gaa ttt tgt gac gca cta gag agt ctc cca gag gaa ggg     2736
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gtg aaa ggt tta act tca ctc acc gag ttg tct gtc agt aac tgt atg     2784
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atg cta aaa tgt tta ccg gag gga ttg cag cac cta aca gcc ctc aca     2832
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act tta aca att act caa tgt cca ata gta ttc aag cgg tgt gag agg     2880
Thr Leu Thr Ile Thr Gln Cys Pro Ile Val Phe Lys Arg Cys Glu Arg
945                  950                  955                  960

gga ata gga gaa gac tgg cac aaa att gct cac att cca tat ttg act     2928
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Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys
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Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
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Thr Lys Ala Thr Arg Phe Leu Gln Ser Glu Tyr Gly Arg Tyr His Pro
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Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
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Ile Val Lys Ile Leu Ile Asn Thr Ala Ser Asp Ala Gln Lys Leu Ser
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Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln His Lys Trp Ala
            260   265   270

Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Phe Val Leu
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Ala Lys Thr Leu Gly Gly Ile Leu Arg Phe Lys Arg Glu Glu Arg Glu
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Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
385   390   395   400

Asp Leu Arg Gln Cys Phe Val Tyr Cys Ala Val Phe Pro Lys Asp Thr
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Lys Met Ala Lys Glu Asn Leu Ile Ala Phe Trp Met Ala His Gly Phe
            420   425   430

Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn Glu Val
            435   440   445

Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Glu
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Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Asn Ile Arg Glu Ile
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Val Ser Ser Tyr Ser Pro Ser Leu Leu Gln Lys Phe Val Ser Leu Arg
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Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile
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Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Cys Ser Leu
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Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Ser Leu
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Ser Cys Phe Val Ile Gly Lys Arg Lys Gly His Gln Leu Gly Glu Leu
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Lys Asn Leu Asn Leu Tyr Gly Ser Ile Ser Ile Thr Lys Leu Asp Arg
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Asn Leu His Ser Leu Cys Leu Ser Trp Asp Leu Asp Gly Lys His Arg
    675   680   685

Tyr Asp Ser Glu Val Leu Glu Ala Leu Lys Pro His Ser Asn Leu Lys
    690   695   700

Tyr Leu Glu Ile Asn Gly Phe Gly Gly Ile Arg Leu Pro Asp Trp Met
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Asn Gln Ser Val Leu Lys Asn Val Val Ser Ile Arg Ile Arg Gly Cys
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Phe Pro Val Leu Glu Glu Met Thr Phe Tyr Trp Cys Pro Met Phe Val
            805   810   815

Ile Pro Thr Leu Ser Ser Val Lys Thr Leu Lys Val Ile Val Thr Asp
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Ala Thr Val Leu Arg Ser Ile Ser Asn Leu Arg Ala Leu Thr Ser Leu
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Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys Ile Ser Phe Phe Arg Asn
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Leu Lys Phe Glu Phe Cys Asp Ala Leu Glu Ser Leu Pro Glu Glu Gly
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Val Lys Gly Leu Thr Ser Leu Thr Glu Leu Ser Val Ser Asn Cys Met
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Phe Gln Asp Glu Phe Gln Arg Leu Ser Ser Met Phe Ser Thr Ile Gln
        75              80              85

gcc gtc ctt gaa gat gct cag gag aag caa ctc aac aac aag cct cta    2677
Ala Val Leu Glu Asp Ala Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu
    90              95              100

gaa aat tgg ttg caa aaa ctc aat gct gct aca tat gaa gtc gat gac    2725
Glu Asn Trp Leu Gln Lys Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp
105             110             115             120

atc ttg gat gaa tat aaa acc aag gcc aca aga ttc tcc cag tct gaa    2773
Ile Leu Asp Glu Tyr Lys Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu
            125             130             135

tat ggc cgt tat cat cca aag gtt atc cct t tccgtcacaa ggtcgggaaa    2824
Tyr Gly Arg Tyr His Pro Lys Val Ile Pro
            140             145

aggatggacc aagtgatgaa aaaactaaag gcaattgctg aggaaagaaa gaattttcat    2884

ttgcacgaaa aaattgtaga gagacaagct gttagacggg aaacaggtac tcatcttaaa    2944

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atctgaatat acttgtcaaa tctggcaagc tcagaatcaa attatccacc ccaactttta    3124

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aagcagctca gagaaaagag gttttcttct attctgtttc tctgtgtgct gcacttgggt    3304

ccttaatccc attaaaaaca gggcatgtta atcccaacga cggtagcctt tcctgacagc    3364

tgactgtaaa ttttgtctaa caaagaaaaa aaaagattag acatgttttt ccttgtcatt    3424

gattaggctg gatttctttc agagtggaac at ag  ggg ata tat tgg acc aaa    3476
                                       Gly Ile Tyr Trp Thr Lys
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agt aga atg ggt ata tat tta aag tat ttc tga tag aac agg agt ata    3524
Ser Arg Met Gly Ile Tyr Leu Lys Tyr Phe         Asn Arg Ser Ile
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ttg tgc gaa aat atc ctc tat ttt ctg ttg tct cct aat gag ttt gaa    3572
Leu Cys Glu Asn Ile Leu Tyr Phe Leu Leu Ser Pro Asn Glu Phe Glu
        170                 175                 180

tgt aat aat att ctc atg tgg aca ttg ctt gca cca ggt tct gta tta    3620
Cys Asn Asn Ile Leu Met Trp Thr Leu Leu Ala Pro Gly Ser Val Leu
        185                 190                 195

acc gaa ccg cag gtt tat gga aga gac aaa gag aaa gat gag ata gtg    3668
Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu Ile Val
200                 205                 210                 215

aaa atc cta ata aac aat gtt agt gat gcc caa cac ctt tca gtc ctc    3716
Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser Val Leu
                220                 225                 230

cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc caa atg    3764
Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala Gln Met
            235                 240                 245

gtc ttc aat gac cag aga gtt act gag cat ttc cat tcc aaa ata tgg    3812
Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys Ile Trp
            250                 255                 260

att tgt gtc tcg gaa gat ttt gat gag aag agg tta ata aag gca att    3860
Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys Ala Ile
        265                 270                 275

gta gaa tct att gaa gga agg cca cta ctt ggt gag atg gac ttg gct    3908
Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp Leu Ala
280                 285                 290                 295

cca ctt caa aag aag ctt cag gag ttg ctg aat gga aaa aga tac ttg    3956
Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr Leu
            300                 305                 310

ctt gtc tta gat gat gtt tgg aat gaa gat caa cag aag tgg gct aat    4004
Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp Ala Asn
            315                 320                 325

tta aga gca gtc ttg aag gtt gga gca agt ggt gct tct gtt cta acc    4052
Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val Leu Thr
        330                 335                 340

act act cgt ctt gaa aag gtt gga tca att atg gga aca ttg caa cca    4100
Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu Gln Pro
    345                 350                 355

tat gaa ctg tca aac ctg tct caa gaa gat tgt tgg ttg ttg ttc atg    4148
Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu Phe Met
360                 365                 370                 375

caa cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt gtg gca    4196
Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu Val Ala
            380                 385                 390

atc gga aag gag att gtg aaa aaa agt ggt ggt gtg cct cta gca gcc    4244
Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu Ala Ala
            395                 400                 405

aaa act ctt gga ggt att ttg tgc ttc aag aga gaa gaa aga gca tgg    4292
Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg Ala Trp
        410                 415                 420
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gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat gaa agt    4340
Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp Glu Ser
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tct att ctg cct gcc ctg agg ctt agt tac cat caa ctt cca ctt gat    4388
Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro Leu Asp
440             445             450                     455

ttg aaa caa tgc ttt gcg tat tgt gcg gtg ttc cca aag gat gcc aaa    4436
Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp Ala Lys
                460             465             470

atg aaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt ttt ctt    4484
Met Lys Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly Phe Leu
            475             480             485

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Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu Val Trp
        490             495             500

aaa gaa tta tac ttg agg tct ttt ttc caa gag att gaa gtt aaa gat    4580
Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Lys Asp
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ggt aaa act tat ttc aag atg cat gat ctc atc cat gat ttg gca aca    4628
Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala Thr
520             525             530                     535

tct ctg ttt tca gca aac aca tca agc agc aat atc cgt gaa ata aat    4676
Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu Ile Asn
                540             545             550

aaa cac agt tac aca cat atg atg tcc att ggt ttc gcc gaa gtg gtg    4724
Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu Val Val
                555             560             565

ttt ttt tac act ctt ccc ccc ttg gaa aag ttt atc tcg tta aga gtg    4772
Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu Arg Val
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ctt aat cta ggt gat tcg aca ttt aat aag tta cca tct tcc att gga    4820
Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser Ile Gly
    585             590             595

gat cta gta cat tta aga tac ttg aac ctg tat ggc agt ggc atg cgt    4868
Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly Met Arg
600             605             610                     615

agt ctt cca aag cag tta tgc aag ctt caa aat ctg caa act ctt gat    4916
Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr Leu Asp
                620             625             630

cta caa tat tgc acc aag ctt tgt tgt ttg cca aaa gaa aca agt aaa    4964
Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr Ser Lys
                635             640             645

ctt ggt agt ctc cga aat ctt tta ctt gat ggt agc cag tca ttg act    5012
Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser Leu Thr
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tgt atg cca cca agg ata gga tca ttg aca tgc ctt aag act cta ggt    5060
Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr Leu Gly
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caa ttt gtt gtt gga agg aag aaa ggt tat caa ctt ggt gaa cta gga    5108
Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu Leu Gly
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aac cta aat ctc tat ggc tca att aaa atc tcg cat ctt gag aga gtg    5156
Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu Arg Val
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aag aat gat atg gac gca aaa gaa gcc aat tta tct gca aaa ggg aat    5204
Lys Asn Asp Met Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys Gly Asn
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ctg cat tct tta agc atg agt tgg aat aac ttt gga cca cat ata tat    5252
Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His Ile Tyr
            730                 735                 740

gaa tca gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cac tcc aat    5300
Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Ser Asn
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ctg act tct tta aaa atc tat ggc ttc aga gga atc cat ctc cca gag    5348
Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu Pro Glu
760                 765                 770                 775

tgg atg aat cac tca gta ttg aaa aat att gtc tct att cta att agc    5396
Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu Ile Ser
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aac ttc aga aac tgc tca tgc tta cca ccc ttt ggt gat ctg cct tgt    5444
Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu Pro Cys
            795                 800                 805

cta gaa agt cta gag tta cac tgg ggg tct gcg gat gtg gag tat gtt    5492
Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu Tyr Val
            810                 815                 820

gaa gaa gtg gat att gat gtt cat tct gga ttc ccc aca aga ata agg    5540
Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg Ile Arg
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ttt cca tcc ttg agg aaa ctt gat ata tgg gac ttt ggt agt ctg aaa    5588
Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser Leu Lys
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gga ttg ctg aaa aag gaa gga gaa gag caa ttc cct gtg ctt gaa gag    5636
Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu Glu Glu
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Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn Leu Arg
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gct ctt act tcc ctc aga att tgc tat aat aaa gta gct act tca ttc    5732
Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr Ser Phe
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cca gaa gag atg ttc aaa aac ctt gca aat ctc aaa tac ttg aca atc    5780
Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu Thr Ile
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Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser Leu
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Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
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agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct     144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
            35                  40                  45

cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa     192
Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys
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Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65                  70                  75                  80

acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca     288
Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro
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Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
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Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
            115                 120                 125

cac gaa aaa att gta gag aga caa gct gtt aga cgg gaa aca ggt tct     432
His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser
        130                 135                 140

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Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
145                 150                 155                 160

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Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser
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gtc ctc cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc     576
Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
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Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys
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Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys
        210                      215                  220

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Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp
225                      230                  235                  240

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Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg
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Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp
                260                      265                  270

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Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val
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Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu
        290                      295                  300

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305                      310                  315                  320

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Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu
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Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu
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Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg
                355                      360                  365

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Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro
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Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp
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gcc aaa atg aaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt       1296
Ala Lys Met Lys Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly
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Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu
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Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val
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Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu
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Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu
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ctt gat cta caa tat tgc acc aag ctt tgt tgt ttg cca aaa gaa aca      1776
Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr
                580                 585                 590

agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggt agc cag tca      1824
Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser
                595                 600                 605

ttg act tgt atg cca cca agg ata gga tca ttg aca tgc ctt aag act      1872
Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr
                610                 615                 620

cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat caa ctt ggt gaa      1920
Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu
625                 630                 635                 640

cta gga aac cta aat ctc tat ggc tca att aaa atc tcg cat ctt gag      1968
Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu
                645                 650                 655

aga gtg aag aat gat atg gac gca aaa gaa gcc aat tta tct gca aaa      2016
Arg Val Lys Asn Asp Met Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys
                660                 665                 670

ggg aat ctg cat tct tta agc atg agt tgg aat aac ttt gga cca cat      2064
Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His
                675                 680                 685

ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cac      2112
Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His
                690                 695                 700

tcc aat ctg act tct tta aaa atc tat ggc ttc aga gga atc cat ctc      2160
Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu
705                 710                 715                 720

cca gag tgg atg aat cac tca gta ttg aaa aat att gtc tct att cta      2208
Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu
                725                 730                 735

att agc aac ttc aga aac tgc tca tgc tta cca ccc ttt ggt gat ctg      2256
Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu
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                    740   745   750

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cct tgt cta gaa agt cta gag tta cac tgg ggg tct gcg gat gtg gag    2304
Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu
        755                     760                     765

tat gtt gaa gaa gtg gat att gat gtt cat tct gga ttc ccc aca aga    2352
Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg
        770                     775                     780

ata agg ttt cca tcc ttg agg aaa ctt gat ata tgg gac ttt ggt agt    2400
Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser
785                     790                     795                     800

ctg aaa gga ttg ctg aaa aag gaa gga gaa gag caa ttc cct gtg ctt    2448
Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu
                805                     810                     815

gaa gag atg ata att cac gag tgc cct ttt ctg acc ctt tct tct aat    2496
Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn
                820                     825                     830

ctt agg gct ctt act tcc ctc aga att tgc tat aat aaa gta gct act    2544
Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr
                835                     840                     845

tca ttc cca gaa gag atg ttc aaa aac ctt gca aat ctc aaa tac ttg    2592
Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu
        850                     855                     860

aca atc tct cgg tgc aat aat ctc aaa gag ctg cct acc agc ttg gct    2640
Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala
865                     870                     875                     880

agt ctg aat gct ttg aaa agt cta aaa att caa ttg tgt tgc gca cta    2688
Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu
                885                     890                     895

gag agt ctc cct gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag    2736
Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu
                900                     905                     910

tta ttt gtt gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg    2784
Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu
                915                     920                     925

cag cac cta aca acc ctc aca agt tta aaa att cgg gga tgt cca caa    2832
Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln
        930                     935                     940

ctg atc aag cgg tgt gag aag gga ata gga gaa gac tgg cac aaa att    2880
Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile
945                     950                     955                     960

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Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
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Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys
    50   55   60

Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65   70   75   80

Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro
                85   90   95

Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
            100   105   110

Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
        115   120   125

His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser
    130   135   140

Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
145   150   155   160

Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser
            165   170   175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
            180   185   190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys
        195   200   205

Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys
    210   215   220

Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp
225   230   235   240

Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg
            245   250   255

Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp
            260   265   270

Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val
            275   280   285

Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu
    290   295   300

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Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu
305             310             315             320

Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu
            325             330             335

Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu
            340             345             350

Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg
            355             360             365

Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp
    370             375             380

Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro
385             390             395             400

Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp
            405             410             415

Ala Lys Met Lys Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly
            420             425             430

Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu
            435             440             445

Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val
    450             455             460

Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu
465             470             475             480

Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu
            485             490             495

Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu
            500             505             510

Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu
            515             520             525

Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser
    530             535             540

Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly
545             550             555             560

Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr
            565             570             575
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Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr
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Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser
        595             600             605

Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr
    610             615             620

Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu
625             630             635             640

Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu
            645             650             655

Arg Val Lys Asn Asp Met Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys
        660             665             670

Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His
    675             680             685

Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His
    690             695             700

Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu
705             710             715             720

Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu
            725             730             735

Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu
            740             745             750

Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu
        755             760             765

Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg
    770             775             780

Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser
785             790             795             800

Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu
            805             810             815

Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn
        820             825             830

Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr
        835             840             845

Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu
    850             855             860
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Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala
865             870             875             880


Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu
        885             890             895


Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu
        900             905             910


Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu
        915             920             925


Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln
    930             935             940


Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile
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Ser His Ile Pro Asn Val Asn Ile Tyr Ile
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1               5                   10                  15

ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa      96
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
            20                  25                  30

agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct     144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
        35                  40                  45

cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa     192
Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys
    50                  55                  60

ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa     240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65                  70                  75                  80

acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca     288
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                                  WARFO235.ST25.txt
Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro
                85                  90                  95

aag gtt atc cct ttc cgt cac aag gtc ggg aaa agg atg gac caa gtg        336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
                100                 105                 110

atg aaa aaa cta aag gca att gct gag gaa aga aag aat ttt cat ttg        384
Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
                115                 120                 125

cac gaa aaa att gta gag aga caa gct gttagacggg aaacaggtac              431
His Glu Lys Ile Val Glu Arg Gln Ala
        130                 135

tcatcttaaa ttagtattac aacaactaag tttatattca ttttttggc aattatgaaa      491

ttcagaaaag ggttaaatat actcatgtcc tatcgtaaat agtgtaaata tacctctcgt      551

tgtactttcg atctgaatat acttgtcaaa tctggcaagc tcagaatcaa attatccacc      611

ccaactttta aatactcgat atctttagaa atccacct gtc taa ctc atc cac tac     667
                                           Val     Leu Ile His Tyr
                                                           140

cca ttc cct ttg ctt tga att ctt ttc ttt acc tat aaa cgt gga aca       715
Pro Phe Pro Leu Leu     Ile Leu Phe Phe Thr Tyr Lys Arg Gly Thr
            145                 150                 155

ctc gat ccg ttt tgc ttt tct taa caa agc agc tca gag aaa aga ggt       763
Leu Asp Pro Phe Cys Phe Ser     Gln Ser Ser Ser Glu Lys Arg Gly
            160                 165                 170

ttt ctt cta ttc tgt ttc tct gtg tgc tgc act tgg gtc ctt aat ccc       811
Phe Leu Leu Phe Cys Phe Ser Val Cys Cys Thr Trp Val Leu Asn Pro
            175                 180                 185

att aaa aac agg gca tgt taa tcc caa cga cgg tag cct ttc ctg aca       859
Ile Lys Asn Arg Ala Cys     Ser Gln Arg Arg     Pro Phe Leu Thr
        190                 195                 200

gct gac tgt aaa ttt tgt cta aca aag aaa aaa aaa gat tag aca tgt       907
Ala Asp Cys Lys Phe Cys Leu Thr Lys Lys Lys Lys Asp     Thr Cys
            205                 210                 215

ttt tcc ttg tca ttg att agg ctg gat ttc ttt cag agt gga aca tag       955
Phe Ser Leu Ser Leu Ile Arg Leu Asp Phe Phe Gln Ser Gly Thr
            220                 225                 230

ggg ata tat tgg acc aaa agt aga atg ggt ata tat tta aag tat ttc       1003
Gly Ile Tyr Trp Thr Lys Ser Arg Met Gly Ile Tyr Leu Lys Tyr Phe
            235                 240                 245

tga tag aac agg agt ata ttg tgc gaa aat atc ctc tat ttt ctg ttg       1051
        Asn Arg Ser Ile Leu Cys Glu Asn Ile Leu Tyr Phe Leu Leu
                250                 255                 260

tct cct aat gag ttt gaa tgt aat aat att ctc atg tgg aca ttg ctt       1099
Ser Pro Asn Glu Phe Glu Cys Asn Asn Ile Leu Met Trp Thr Leu Leu
            265                 270                 275

gca cca ggt tct gta tta acc gaa ccg cag gtt tat gga aga gac aaa       1147
Ala Pro Gly Ser Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys
        280                 285                 290

gag aaa gat gag ata gtg aaa atc cta ata aac aat gtt agt gat gcc       1195
Glu Lys Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala
295                 300                 305                 310

caa cac ctt tca gtc ctc cca ata ctt ggt atg ggg gga tta gga aaa       1243
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Gln His Leu Ser Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys
            315                 320                 325


acg act ctt gcc caa atg gtc ttc aat gac cag aga gtt act gag cat    1291
Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His
            330                 335                 340


ttc cat tcc aaa ata tgg att tgt gtc tcg gaa gat ttt gat gag aag    1339
Phe His Ser Lys Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys
            345                 350                 355


agg tta ata aag gca att gta gaa tct att gaa gga agg cca cta ctt    1387
Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu
            360                 365                 370


ggt gag atg gac ttg gct cca ctt caa aag aag ctt cag gag ttg ctg    1435
Gly Glu Met Asp Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu
375                 380                 385                 390


aat gga aaa aga tac ttg ctt. gtc tta gat gat gtt tgg aat gaa gat    1483
Asn Gly Lys Arg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp
            395                 400                 405


caa cag aag tgg gct aat tta aga gca gtc ttg aag gtt gga gca agt    1531
Gln Gln Lys Trp Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser
            410                 415                 420


ggt gct tct gtt cta acc act act cgt ctt gaa aag gtt gga tca att    1579
Gly Ala Ser Val Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile
            425                 430                 435


atg gga aca ttg caa cca tat gaa ctg tca aat ctg tct caa gaa gat    1627
Met Gly Thr Leu Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp
            440                 445                 450


tgt tgg ttg ttg ttc atg caa cgt gca ttt gga cac caa gaa gaa ata    1675
Cys Trp Leu Leu Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile
455                 460                 465                 470


aat cca aac ctt gtg gca atc gga aag gag att gtg aaa aaa agt ggt    1723
Asn Pro Asn Leu Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly
            475                 480                 485


ggt gtg cct cta gca gcc aaa act ctt gga ggt att ttg tgc ttc aag    1771
Gly Val Pro Leu Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys
            490                 495                 500


aga gaa gaa aga gca tgg gaa cat gtg aga gac agt ccg att tgg aat    1819
Arg Glu Glu Arg Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn
            505                 510                 515


ttg cct caa gat gaa agt tct att ctg cct gcc ctg agg ctt agt tac    1867
Leu Pro Gln Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr
            520                 525                 530


cat caa ctt cca ctt gat ttg aaa caa tgc ttt gcg tat tgt gcg gtg    1915
His Gln Leu Pro Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val
535                 540                 545                 550


ttc cca aag gat gcc aaa atg gaa aaa gaa aag cta atc tct ctc tgg    1963
Phe Pro Lys Asp Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp
            555                 560                 565


atg gcg cat ggt ttt ctt tta tca aaa gga aac atg gag cta gag gat    2011
Met Ala His Gly Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp
            570                 575                 580


gtg ggc gat gaa gta tgg aaa gaa tta tac ttg agg tct ttt ttc caa    2059
Val Gly Asp Glu Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln
            585                 590                 595
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Glu Ile Glu Val Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu
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atc cat gat ttg gca aca tct ctg ttt tca gca aac aca tca agc agc   2155
Ile His Asp Leu Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser
615             620             625             630

aat atc cgt gaa ata aat aaa cac agt tac aca cat atg atg tcc att   2203
Asn Ile Arg Glu Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile
                635             640             645

ggt ttc gcc gaa gtg gtg ttt ttt tac act ctt ccc ccc ttg gaa aag   2251
Gly Phe Ala Glu Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys
            650             655             660

ttt atc tcg tta aga gtg ctt aat cta ggt gat tcg aca ttt aat aag   2299
Phe Ile Ser Leu Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys
            665             670             675

tta cca tct tcc att gga gat cta gta cat tta aga tac ttg aac ctg   2347
Leu Pro Ser Ser Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu
    680             685             690

tat ggc agt ggc atg cgt agt ctt cca aag cag tta tgc aag ctt caa   2395
Tyr Gly Ser Gly Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln
695             700             705             710

aat ctg caa act ctt gat cta caa tat tgc acc aag ctt tgt tgt ttg   2443
Asn Leu Gln Thr Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu
            715             720             725

cca aaa gaa aca agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat   2491
Pro Lys Glu Thr Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp
            730             735             740

ggt agc cag tca ttg act tgt atg cca cca agg ata gga tca ttg aca   2539
Gly Ser Gln Ser Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr
            745             750             755

tgc ctt aag act cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat   2587
Cys Leu Lys Thr Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr
    760             765             770

caa ctt ggt gaa cta gga aac cta aat ctc tat ggc tca att aaa atc   2635
Gln Leu Gly Glu Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile
775             780             785             790

tcg cat ctt gag aga gtg aag aat gat aag gac gca aaa gaa gcc aat   2683
Ser His Leu Glu Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn
            795             800             805

tta tct gca aaa ggg aat ctg cat tct tta agc atg agt tgg aat aac   2731
Leu Ser Ala Lys Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn
            810             815             820

ttt gga cca cat ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc   2779
Phe Gly Pro His Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala
            825             830             835

ctc aaa cca cac tcc aat ctg act tct tta aaa atc tat ggc ttc aga   2827
Leu Lys Pro His Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg
    840             845             850

gga atc cat ctc cca gag tgg atg aat cac tca gta ttg aaa aat att   2875
Gly Ile His Leu Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile
855             860             865             870

gtc tct att cta att agc aac ttc aga aac tgc tca tgc tta cca ccc   2923
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Phe Gly Asp Leu Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser
            890                 895                 900

gcg gat gtg gag tat gtt gaa gaa gtg gat att gat gtt cat tct gga        3019
Ala Asp Val Glu Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly
            905                 910                 915

ttc ccc aca aga ata agg ttt cca tcc ttg agg aaa ctt gat ata tgg        3067
Phe Pro Thr Arg Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp
            920                 925                 930

gac ttt ggt agt ctg aaa gga ttg ctg aaa aag gaa gga gaa gag caa        3115
Asp Phe Gly Ser Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln
935                 940                 945                 950

ttc cct gtg ctt gaa gag atg ata att cac gag tgc cct ttt ctg acc        3163
Phe Pro Val Leu Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr
                955                 960                 965

ctt tct tct aat ctt agg gct ctt act tcc ctc aga att tgc tat aat        3211
Leu Ser Ser Asn Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn
                970                 975                 980

aaa gta gct act tca ttc cca gaa gag atg ttc aaa aac ctt gca aat        3259
Lys Val Ala Thr Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn
            985                 990                 995

ctc aaa tac ttg aca atc tct cgg tgc aat aat ctc aaa gag ctg           3304
Leu Lys Tyr Leu Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu
        1000                1005                1010

cct acc agc ttg gct agt ctg aat gct ttg aaa agt cta aaa att          3349
Pro Thr Ser Leu Ala Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile
        1015                1020                1025

caa ttg tgt tgc gca cta gag agt ctc cct gag gaa ggg ctg gaa          3394
Gln Leu Cys Cys Ala Leu Glu Ser Leu Pro Glu Glu Gly Leu Glu
        1030                1035                1040

ggt tta tct tca ctc aca gag tta ttt gtt gaa cac tgt aac atg          3439
Gly Leu Ser Ser Leu Thr Glu Leu Phe Val Glu His Cys Asn Met
        1045                1050                1055

cta aaa tgt tta cca gag gga ttg cag cac cta aca acc ctc aca          3484
Leu Lys Cys Leu Pro Glu Gly Leu Gln His Leu Thr Thr Leu Thr
        1060                1065                1070

agt tta aaa att cgg gga tgt cca caa ctg atc aag cgg tgt gag          3529
Ser Leu Lys Ile Arg Gly Cys Pro Gln Leu Ile Lys Arg Cys Glu
        1075                1080                1085

aag gga ata gga gaa gac tgg cac aaa att tct cac att cct aat          3574
Lys Gly Ile Gly Glu Asp Trp His Lys Ile Ser His Ile Pro Asn
        1090                1095                1100

gtg aat ata tat att taa                                               3592
Val Asn Ile Tyr Ile
        1105
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Met Ala Glu Ala Phe Ile Gln Val Leu Leu Asp Asn Leu Thr Ser Phe
1               5                   10                  15

ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa       96
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
                20                  25                  30

agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct      144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
            35                  40                  45

cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa      192
Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys
        50                  55                  60

ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa      240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65                  70                  75                  80

acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca      288
Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro
                85                  90                  95

aag gtt atc cct ttc cgt cac aag gtc ggg aaa agg atg gac caa gtg      336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
                100                 105                 110

atg aaa aaa cta aag gca att gct gag gaa aga aag aat ttt cat ttg      384
Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
            115                 120                 125

cac gaa aaa att gta gag aga caa gct gtt aga cgg gaa aca ggt tct      432
His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser
        130                 135                 140

gta tta acc gaa ccg cag gtt tat gga aga gac aaa gag aaa gat gag      480
Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
145                 150                 155                 160

ata gtg aaa atc cta ata aac aat gtt agt gat gcc caa cac ctt tca      528
Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser
                165                 170                 175

gtc ctc cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc      576
Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
                180                 185                 190

caa atg gtc ttc aat gac cag aga gtt act gag cat ttc cat tcc aaa      624
Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys
            195                 200                 205

ata tgg att tgt gtc tcg gaa gat ttt gat gag aag agg tta ata aag      672
Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys
            210                 215                 220

gca att gta gaa tct att gaa gga agg cca cta ctt ggt gag atg gac      720
Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp
225                 230                 235                 240

ttg gct cca ctt caa aag aag ctt cag gag ttg ctg aat gga aaa aga      768
Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg
                245                 250                 255

tac ttg ctt gtc tta gat gat gtt tgg aat gaa gat caa cag aag tgg      816
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Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp
        260             265             270

gct aat tta aga gca gtc ttg aag gtt gga gca agt ggt gct tct gtt        864
Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val
        275             280             285

cta acc act act cgt ctt gaa aag gtt gga tca att atg gga aca ttg        912
Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu
        290             295             300

caa cca tat gaa ctg tca aat ctg tct caa gaa gat tgt tgg ttg ttg        960
Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu
305             310             315             320

ttc atg caa cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt       1008
Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu
                325             330             335

gtg gca atc gga aag gag att gtg aaa aaa agt ggt ggt gtg cct cta       1056
Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu
            340             345             350

gca gcc aaa act ctt gga ggt att ttg tgc ttc aag aga gaa gaa aga       1104
Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg
            355             360             365

gca tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat       1152
Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp
        370             375             380

gaa agt tct att ctg cct gcc ctg agg ctt agt tac cat caa ctt cca       1200
Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro
385             390             395             400

ctt gat ttg aaa caa tgc ttt gcg tat tgt gcg gtg ttc cca aag gat       1248
Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp
                405             410             415

gcc aaa atg gaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt       1296
Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly
                420             425             430

ttt ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc gat gaa       1344
Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu
            435             440             445

gta tgg aaa gaa tta tac ttg agg tct ttt ttc caa gag att gaa gtt       1392
Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val
        450             455             460

aaa gat ggt aaa act tat ttc aag atg cat gat ctc atc cat gat ttg       1440
Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu
465             470             475             480

gca aca tct ctg ttt tca gca aac aca tca agc agc aat atc cgt gaa       1488
Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu
                485             490             495

ata aat aaa cac agt tac aca cat atg atg tcc att ggt ttc gcc gaa       1536
Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu
            500             505             510

gtg gtg ttt ttt tac act ctt ccc ccc ttg gaa aag ttt atc tcg tta       1584
Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu
            515             520             525

aga gtg ctt aat cta ggt gat tcg aca ttt aat aag tta cca tct tcc       1632
Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser
        530             535             540
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att gga gat cta gta cat tta aga tac ttg aac ctg tat ggc agt ggc    1680
Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly
545                 550                 555                 560

atg cgt agt ctt cca aag cag tta tgc aag ctt caa aat ctg caa act    1728
Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr
                565                 570                 575

ctt gat cta caa tat tgc acc aag ctt tgt tgt ttg cca aaa gaa aca    1776
Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr
                580                 585                 590

agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggt agc cag tca    1824
Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser
            595                 600                 605

ttg act tgt atg cca cca agg ata gga tca ttg aca tgc ctt aag act    1872
Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr
            610                 615                 620

cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat caa ctt ggt gaa    1920
Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu
625                 630                 635                 640

cta gga aac cta aat ctc tat ggc tca att aaa atc tcg cat ctt gag    1968
Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu
                645                 650                 655

aga gtg aag aat gat aag gac gca aaa gaa gcc aat tta tct gca aaa    2016
Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys
                660                 665                 670

ggg aat ctg cat tct tta agc atg agt tgg aat aac ttt gga cca cat    2064
Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His
            675                 680                 685

ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cac    2112
Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His
            690                 695                 700

tcc aat ctg act tct tta aaa atc tat ggc ttc aga gga atc cat ctc    2160
Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu
705                 710                 715                 720

cca gag tgg atg aat cac tca gta ttg aaa aat att gtc tct att cta    2208
Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu
                725                 730                 735

att agc aac ttc aga aac tgc tca tgc tta cca ccc ttt ggt gat ctg    2256
Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu
                740                 745                 750

cct tgt cta gaa agt cta gag tta cac tgg ggg tct gcg gat gtg gag    2304
Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu
            755                 760                 765

tat gtt gaa gaa gtg gat att gat gtt cat tct gga ttc ccc aca aga    2352
Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg
            770                 775                 780

ata agg ttt cca tcc ttg agg aaa ctt gat ata tgg gac ttt ggt agt    2400
Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser
785                 790                 795                 800

ctg aaa gga ttg ctg aaa aag gaa gga gaa gag caa ttc cct gtg ctt    2448
Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu
                805                 810                 815

gaa gag atg ata att cac gag tgc cct ttt ctg acc ctt tct tct aat    2496
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Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn
        820             825             830

ctt agg gct ctt act tcc ctc aga att tgc tat aat aaa gta gct act       2544
Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr
        835             840             845

tca ttc cca gaa gag atg ttc aaa aac ctt gca aat ctc aaa tac ttg       2592
Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu
    850             855             860

aca atc tct cgg tgc aat aat ctc aaa gag ctg cct acc agc ttg gct       2640
Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala
865             870             875             880

agt ctg aat gct ttg aaa agt cta aaa att caa ttg tgt tgc gca cta       2688
Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu
            885             890             895

gag agt ctc cct gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag       2736
Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu
            900             905             910

tta ttt gtt gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg       2784
Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu
        915             920             925

cag cac cta aca acc ctc aca agt tta aaa att cgg gga tgt cca caa       2832
Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln
        930             935             940

ctg atc aag cgg tgt gag aag gga ata gga gaa gac tgg cac aaa att       2880
Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile
945             950             955             960

tct cac att cct aat gtg aat ata tat att taa                           2913
Ser His Ile Pro Asn Val Asn Ile Tyr Ile
            965             970
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<213>   Solanum bulbocastanum

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1               5               10              15


Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
            20              25              30


Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
        35              40              45


Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys
    50              55              60


Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65              70              75              80


Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro
            85              90              95
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-    Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
                 100             105             110

     Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
             115             120             125

     His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser
         130             135             140

     Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
     145             150             155             160

     Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser
                 165             170             175

     Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
                 180             185             190

     Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys
             195             200             205

     Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys
         210             215             220

     Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp
     225             230             235             240

     Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg
       .         245             250             255

     Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp
                 260             265             270

     Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val
             275             280             285

     Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu
         290             295             300

     Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu
     305             310             315             320

     Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu
                 325             330             335

     Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu
                 340             345             350

     Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg
                 355             360             365

     Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp
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370   375   380

Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro
385   390   395   400

Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp
                405   410   415

Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly
            420   425   430

Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu
            435   440   445

Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val
    450   455   460

Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu
465   470   475   480

Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu
                485   490   495

Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu
            500   505   510

Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu
        515   520   525

Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser
    530   535   540

Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly
545   550   555   560

Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr
                565   570   575

Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr
            580   585   590

Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Ser Gln Ser
        595   600   605

Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr
    610   615   620

Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu
625   630   635   640

Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu
            645   650   655

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Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys
        660   665   670

Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His
        675   680   685

Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His
    690   695   700

Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu
705   710   715   720

Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu
            725   730   735

Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu
            740   745   750

Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu
        755   760   765

Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg
    770   775   780

Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser
785   790   795   800

Leu Lys Gly Leu Leu Lys Lys Glu Gly Glu Glu Gln Phe Pro Val Leu
            805   810   815

Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn
        820   825   830

Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr
        835   840   845

Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu
    850   855   860

Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala
865   870   875   880

Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu
            885   890   895

Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu
        900   905   910

Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu
        915   920   925

Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln

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Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile
945                 950                 955                 960


Ser His Ile Pro Asn Val Asn Ile Tyr Ile
                965                 970
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1               5                   10                  15

atc caa ggg gaa ctt gga ttg gtt ttt ggt ttc gag aag gag ttt aaa        96
Ile Gln Gly Glu Leu Gly Leu Val Phe Gly Phe Glu Lys Glu Phe Lys
                20                  25                  30

aaa ctt tca agt atg ttt tca atg atc caa gct gtg cta gaa gat gct       144
Lys Leu Ser Ser Met Phe Ser Met Ile Gln Ala Val Leu Glu Asp Ala
            35                  40                  45

caa gag aag caa ctg aag tac aag gca ata aag aac tgg tta cag aaa       192
Gln Glu Lys Gln Leu Lys Tyr Lys Ala Ile Lys Asn Trp Leu Gln Lys
        50                  55                  60

ctc aat gtt gct gca tat gaa gtt gat gac atc ttg gat gac tgt aaa       240
Leu Asn Val Ala Ala Tyr Glu Val Asp Asp Ile Leu Asp Asp Cys Lys
65                  70                  75                  80

act gag gca gca aga ttc aag cag gct gta ttg ggg cgt tat cat cca       288
Thr Glu Ala Ala Arg Phe Lys Gln Ala Val Leu Gly Arg Tyr His Pro
                85                  90                  95

cgg acc atc act ttc tgt tac aag gtg gga aaa aga atg aaa gaa atg       336
Arg Thr Ile Thr Phe Cys Tyr Lys Val Gly Lys Arg Met Lys Glu Met
            100                 105                 110

atg gaa aaa cta gat gca att gca gag gaa cgg agg aat ttt cat tta       384
Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg Arg Asn Phe His Leu
        115                 120                 125

gat gaa agg att ata gag aga caa gct gct aga cgg caa aca ggt ttt       432
Asp Glu Arg Ile Ile Glu Arg Gln Ala Ala Arg Arg Gln Thr Gly Phe
    130                 135                 140

gtt tta act gag cca aaa gtt tat gga agg gaa aaa gag gag gat gag       480
Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Glu Lys Glu Glu Asp Glu
145                 150                 155                 160

ata gtg aaa atc ttg ata aac aat gtt agt tat tcc gaa gaa gtt cca       528
Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr Ser Glu Glu Val Pro
                165                 170                 175

gta ctc cca ata ctt ggt atg ggg gga cta gga aag acg act cta gcc       576
Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
            180                 185                 190
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caa atg gtc ttc aat gat caa aga att act gag cat ttc aat cta aag        624
Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu His Phe Asn Leu Lys
        195                 200                 205

ata tgg gtt tgt gtc tca gat gat ttt gat gag aag agg ttg att aag        672
Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu Ile Lys
        210                 215                 220

gca att gta gaa tct att gaa gga aag tca ctg ggt gac atg gac ttg        720
Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Gly Asp Met Asp Leu
225                 230                 235                 240

gct ccc ctc cag aaa aag ctt cag gag ttg ttg aat gga aaa aga tac       768
Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr
                245                 250                 255

ttt ctt gtt ttg gat gat gtt tgg aat gaa gat caa gaa aag tgg gat       816
Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Glu Lys Trp Asp
                260                 265                 270

aat ctt aga gca gta ttg aag att gga gct agt ggt gct tca att cta       864
Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser Gly Ala Ser Ile Leu
                275                 280                 285

att act act cgt ctt gaa aaa att gga tca att atg gga act ttg caa       912
Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile Met Gly Thr Leu Gln
        290                 295                 300

cta tat cag tta tca aat ttg tct caa gaa gat tgt tgg ttg ttg ttc       960
Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu Phe
305                 310                 315                 320

aag caa cgt gca ttt tgc cac caa acc gaa aca agt cct aaa ctt atg      1008
Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr Ser Pro Lys Leu Met
                325                 330                 335

gaa atc gga aag gag att gtg aag aaa tgt ggg ggt gtg cct cta gca      1056
Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala
                340                 345                 350

gcc aaa act ctt gga ggc ctt tta cgc ttc aag agg gaa gaa agt gaa      1104
Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu Ser Glu
                355                 360                 365

tgg gaa cat gtg aga gat agt gag att tgg aat tta cct caa gat gaa      1152
Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn Leu Pro Gln Asp Glu
        370                 375                 380

aat tct gtt ttg cct gcc ctg agg ctg agt tat cat cat ctt cca ctt      1200
Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
385                 390                 395                 400

gat ttg aga caa tgt ttt gca tat tgc gca gta ttc cca aag gac acc      1248
Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp Thr
                405                 410                 415

aaa ata gaa aag gaa tat ctc atc gct ctc tgg atg gca cac agt ttt      1296
Lys Ile Glu Lys Glu Tyr Leu Ile Ala Leu Trp Met Ala His Ser Phe
                420                 425                 430

ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc aat gaa gta      1344
Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asn Glu Val
                435                 440                 445

tgg aat gaa tta tac ttg agg tct ttt ttc caa gag att gaa gtt aaa      1392
Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Lys
        450                 455                 460

tct ggt aaa act tat ttc aag atg cat gat ctc atc cat gat ttg gct      1440
Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala
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aca tct atg ttt tca gca agc gca tca agc aga agt ata cgc caa ata    1488
Thr Ser Met Phe Ser Ala Ser Ala Ser Ser Arg Ser Ile Arg Gln Ile
            485                     490                     495

aat gta aaa gat gat gaa gat atg atg ttc att gta aca aat tat aaa    1536
Asn Val Lys Asp Asp Glu Asp Met Met Phe Ile Val Thr Asn Tyr Lys
            500                     505                     510

gat atg atg tcc att ggt ttc tcc gaa gtg gtg tct tct tac tct cct    1584
Asp Met Met Ser Ile Gly Phe Ser Glu Val Val Ser Ser Tyr Ser Pro
            515                     520                     525

tcg ctc ttt aaa agg ttt gtc tcg tta agg gtg ctt aat cta agt aac    1632
Ser Leu Phe Lys Arg Phe Val Ser Leu Arg Val Leu Asn Leu Ser Asn
        530                     535                     540

tca gaa ttt gaa cag tta ccg tct tcc gtt gga gat cta gta cat tta    1680
Ser Glu Phe Glu Gln Leu Pro Ser Ser Val Gly Asp Leu Val His Leu
545                     550                     555                 560

aga tac ctt gac ctg tct ggt aat aaa att tgt agt ctt cca aag agg    1728
Arg Tyr Leu Asp Leu Ser Gly Asn Lys Ile Cys Ser Leu Pro Lys Arg
            565                     570                     575

ttg tgc aag ctt caa aat ctg cag act ctt gat cta tat aat tgc cag    1776
Leu Cys Lys Leu Gln Asn Leu Gln Thr Leu Asp Leu Tyr Asn Cys Gln
            580                     585                     590

tca ctt tct tgt ttg ccg aaa caa aca agt aag ctt tgt agt ctc cgg    1824
Ser Leu Ser Cys Leu Pro Lys Gln Thr Ser Lys Leu Cys Ser Leu Arg
            595                     600                     605

aat ctt gta ctt gat cac tgt cca ttg act tct atg cca cca aga ata    1872
Asn Leu Val Leu Asp His Cys Pro Leu Thr Ser Met Pro Pro Arg Ile
        610                     615                     620

gga ttg ttg aca tgc ctt aag aca cta ggt tac ttt gtt gta ggc gag    1920
Gly Leu Leu Thr Cys Leu Lys Thr Leu Gly Tyr Phe Val Val Gly Glu
625                     630                     635                 640

agg aaa ggt tat caa ctt ggt gaa cta cga aat tta aac ctc cgt ggt    1968
Arg Lys Gly Tyr Gln Leu Gly Glu Leu Arg Asn Leu Asn Leu Arg Gly
            645                     650                     655

gca att tca atc aca cat ctt gag aga gtg aaa aat gat atg gag gca    2016
Ala Ile Ser Ile Thr His Leu Glu Arg Val Lys Asn Asp Met Glu Ala
            660                     665                     670

aaa gaa gcc aat tta tct gca aaa gca aat cta cac tct tta agc atg    2064
Lys Glu Ala Asn Leu Ser Ala Lys Ala Asn Leu His Ser Leu Ser Met
            675                     680                     685

agt tgg gat aga cca aac aga tat gaa tcc gaa gaa gtt aaa gtg ctt    2112
Ser Trp Asp Arg Pro Asn Arg Tyr Glu Ser Glu Glu Val Lys Val Leu
        690                     695                     700

gaa gcc ctc aaa cca cat ccc aat ctg aaa tat tta gaa atc att gac    2160
Glu Ala Leu Lys Pro His Pro Asn Leu Lys Tyr Leu Glu Ile Ile Asp
705                     710                     715                 720

ttc tgt gga ttc tgt ctc cct gac tgg atg aat cac tca gtt ttg aaa    2208
Phe Cys Gly Phe Cys Leu Pro Asp Trp Met Asn His Ser Val Leu Lys
            725                     730                     735

aat gtt gtc tct att cta att agc ggt tgt gaa aac tgc tcg tgc tta    2256
Asn Val Val Ser Ile Leu Ile Ser Gly Cys Glu Asn Cys Ser Cys Leu
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cca ccc ttt ggt gag ctg cct tgt cta gaa agt ctg gag tta caa gac    2304
Pro Pro Phe Gly Glu Leu Pro Cys Leu Glu Ser Leu Glu Leu Gln Asp
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ggg tct gtg gag gtg gag tat gtt gaa gat tct gga ttc ctg aca aga    2352
Gly Ser Val Glu Val Glu Tyr Val Glu Asp Ser Gly Phe Leu Thr Arg
        770             775             780

aga aga ttt cca tcc ctg aga aaa ctt cat ata ggt ggc ttt tgt aat    2400
Arg Arg Phe Pro Ser Leu Arg Lys Leu His Ile Gly Gly Phe Cys Asn
785             790             795             800

ctg aaa gga ttg cag aga atg aaa gga gca gag caa ttc ccc gtg ctt    2448
Leu Lys Gly Leu Gln Arg Met Lys Gly Ala Glu Gln Phe Pro Val Leu
                805             810             815

gaa gag atg aag att tcg gat tgc cct atg ttt gtt ttt ccg acc ctt    2496
Glu Glu Met Lys Ile Ser Asp Cys Pro Met Phe Val Phe Pro Thr Leu
                820             825             830

tct tct gtc aag aaa tta gaa att tgg ggg gag gca gat gca gga ggt    2544
Ser Ser Val Lys Lys Leu Glu Ile Trp Gly Glu Ala Asp Ala Gly Gly
        835             840             845

ttg agc tcc ata tct aat ctc agc act ctt aca tcc ctc aag att ttc    2592
Leu Ser Ser Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Lys Ile Phe
        850             855             860

agt aac cac aca gtg act tca cta ctg gaa gag atg ttc aaa aac ctt    2640
Ser Asn His Thr Val Thr Ser Leu Leu Glu Glu Met Phe Lys Asn Leu
865             870             875             880

gaa aat ctc ata tac ttg agt gtc tct ttc ttg gag aat ctc aaa gag    2688
Glu Asn Leu Ile Tyr Leu Ser Val Ser Phe Leu Glu Asn Leu Lys Glu
                885             890             895

ctg cct acc agc ctg gct agt ctc aac aat ttg aag tgt ctg gat att    2736
Leu Pro Thr Ser Leu Ala Ser Leu Asn Asn Leu Lys Cys Leu Asp Ile
                900             905             910

cgt tat tgt tac gca cta gag agt ctc ccc gag gaa ggg ctg gaa ggt    2784
Arg Tyr Cys Tyr Ala Leu Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly
        915             920             925

tta tct tca ctc aca gag tta ttt gtt gaa cac tgt aac atg cta aaa    2832
Leu Ser Ser Leu Thr Glu Leu Phe Val Glu His Cys Asn Met Leu Lys
        930             935             940

tgt tta cca gag gga ttg cag cac cta aca acc ctc aca agt tta aaa    2880
Cys Leu Pro Glu Gly Leu Gln His Leu Thr Thr Leu Thr Ser Leu Lys
945             950             955             960

att cgg gga tgt cca caa ctg atc aag cgg tgt gag aag gga ata gga    2928
Ile Arg Gly Cys Pro Gln Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly
                965             970             975

gaa gac tgg cac aaa att tct cac att cct aat gtg aat ata tat att    2976
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taa                                                                2979
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            20                  25              30

Lys Leu Ser Ser Met Phe Ser Met Ile Gln Ala Val Leu Glu Asp Ala
            35              40              45

Gln Glu Lys Gln Leu Lys Tyr Lys Ala Ile Lys Asn Trp Leu Gln Lys
    50                  55              60

Leu Asn Val Ala Ala Tyr Glu Val Asp Asp Ile Leu Asp Asp Cys Lys
65                  70              75                  80

Thr Glu Ala Ala Arg Phe Lys Gln Ala Val Leu Gly Arg Tyr His Pro
                85              90              95

Arg Thr Ile Thr Phe Cys Tyr Lys Val Gly Lys Arg Met Lys Glu Met
            100             105             110

Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg Arg Asn Phe His Leu
        115             120             125

Asp Glu Arg Ile Ile Glu Arg Gln Ala Ala Arg Arg Gln Thr Gly Phe
    130             135             140

Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Glu Lys Glu Glu Asp Glu
145             150             155             160

Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr Ser Glu Glu Val Pro
            165             170             175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
            180             185             190

Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu His Phe Asn Leu Lys
    195             200             205

Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu Ile Lys
    210             215             220

Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Gly Asp Met Asp Leu
225             230             235             240

Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr
            245             250             255

Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Glu Lys Trp Asp
            260             265             270

Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser Gly Ala Ser Ile Leu
    275             280             285
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Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile Met Gly Thr Leu Gln
    290                 295             300

Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu Phe
305                 310             315                 320

Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr Ser Pro Lys Leu Met
                325             330             335

Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala
            340             345             350

Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu Ser Glu
        355             360             365

Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn Leu Pro Gln Asp Glu
    370             375             380

Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
385             390             395                 400

Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp Thr
            405             410             415

Lys Ile Glu Lys Glu Tyr Leu Ile Ala Leu Trp Met Ala His Ser Phe
            420             425             430

Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asn Glu Val
        435             440             445

Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Lys
    450             455             460

Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala
465             470             475                 480

Thr Ser Met Phe Ser Ala Ser Ala Ser Ser Arg Ser Ile Arg Gln Ile
            485             490             495

Asn Val Lys Asp Asp Glu Asp Met Met Phe Ile Val Thr Asn Tyr Lys
            500             505             510

Asp Met Met Ser Ile Gly Phe Ser Glu Val Val Ser Ser Tyr Ser Pro
        515             520             525

Ser Leu Phe Lys Arg Phe Val Ser Leu Arg Val Leu Asn Leu Ser Asn
    530             535             540

Ser Glu Phe Glu Gln Leu Pro Ser Ser Val Gly Asp Leu Val His Leu
545             550             555                 560
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Arg Tyr Leu Asp Leu Ser Gly Asn Lys Ile Cys Ser Leu Pro Lys Arg
            565   570   575

Leu Cys Lys Leu Gln Asn Leu Gln Thr Leu Asp Leu Tyr Asn Cys Gln
            580   585   590

Ser Leu Ser Cys Leu Pro Lys Gln Thr Ser Lys Leu Cys Ser Leu Arg
            595   600   605

Asn Leu Val Leu Asp His Cys Pro Leu Thr Ser Met Pro Pro Arg Ile
    610   615   620

Gly Leu Leu Thr Cys Leu Lys Thr Leu Gly Tyr Phe Val Val Gly Glu
625   630   635   640

Arg Lys Gly Tyr Gln Leu Gly Glu Leu Arg Asn Leu Asn Leu Arg Gly
            645   650   655

Ala Ile Ser Ile Thr His Leu Glu Arg Val Lys Asn Asp Met Glu Ala
            660   665   670

Lys Glu Ala Asn Leu Ser Ala Lys Ala Asn Leu His Ser Leu Ser Met
            675   680   685

Ser Trp Asp Arg Pro Asn Arg Tyr Glu Ser Glu Glu Val Lys Val Leu
    690   695   700

Glu Ala Leu Lys Pro His Pro Asn Leu Lys Tyr Leu Glu Ile Ile Asp
705   710   715   720

Phe Cys Gly Phe Cys Leu Pro Asp Trp Met Asn His Ser Val Leu Lys
            725   730   735

Asn Val Val Ser Ile Leu Ile Ser Gly Cys Glu Asn Cys Ser Cys Leu
            740   745   750

Pro Pro Phe Gly Glu Leu Pro Cys Leu Glu Ser Leu Glu Leu Gln Asp
            755   760   765

Gly Ser Val Glu Val Glu Tyr Val Glu Asp Ser Gly Phe Leu Thr Arg
    770   775   780

Arg Arg Phe Pro Ser Leu Arg Lys Leu His Ile Gly Gly Phe Cys Asn
785   790   795   800

Leu Lys Gly Leu Gln Arg Met Lys Gly Ala Glu Gln Phe Pro Val Leu
            805   810   815

Glu Glu Met Lys Ile Ser Asp Cys Pro Met Phe Val Phe Pro Thr Leu
            820   825   830

Ser Ser Val Lys Lys Leu Glu Ile Trp Gly Glu Ala Asp Ala Gly Gly
    835   840   845

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Leu Ser Ser Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Lys Ile Phe
    850                 855                 860

Ser Asn His Thr Val Thr Ser Leu Leu Glu Glu Met Phe Lys Asn Leu
865                 870                 875                 880

Glu Asn Leu Ile Tyr Leu Ser Val Ser Phe Leu Glu Asn Leu Lys Glu
                885                 890                 895

Leu Pro Thr Ser Leu Ala Ser Leu Asn Asn Leu Lys Cys Leu Asp Ile
            900                 905                 910

Arg Tyr Cys Tyr Ala Leu Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly
        915                 920                 925

Leu Ser Ser Leu Thr Glu Leu Phe Val Glu His Cys Asn Met Leu Lys
    930                 935                 940

Cys Leu Pro Glu Gly Leu Gln His Leu Thr Thr Leu Thr Ser Leu Lys
945                 950                 955                 960

Ile Arg Gly Cys Pro Gln Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly
                965                 970                 975

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1               5                   10                  15

atc gga gat aaa ctt gta ttg att ttc ggt ttc gaa aag gaa tgt gaa      96
Ile Gly Asp Lys Leu Val Leu Ile Phe Gly Phe Glu Lys Glu Cys Glu
                20                  25                  30

aag ctg tcg agt gtg ttt tcc aca att caa gct gtg ctt caa gat gct     144
Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Leu Gln Asp Ala
            35                  40                  45

cag gag aag caa ttg aag gac aag gca att gag aat tgg ttg cag aaa     192
Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys
        50                  55                  60

ctc aat tct gct gcc tat gaa gtt gat gat ata ttg ggc gaa tgt aaa     240
Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys
65                  70                  75                  80

aat gag gca ata aga ttt gag cag tct cga tta ggg ttt tat cac cca     288
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                Asn Glu Ala Ile Arg Phe Glu Gln Ser Arg Leu Gly Phe Tyr His Pro
                              85                  90                  95

ggg att atc aat ttc cgt cac aaa att ggg aga agg atg aaa gag ata        336
Gly Ile Ile Asn Phe Arg His Lys Ile Gly Arg Arg Met Lys Glu Ile
            100                 105                 110

atg gag aaa cta gat gca ata tct gag gaa aga agg aag ttt cat ttc        384
Met Glu Lys Leu Asp Ala Ile Ser Glu Glu Arg Arg Lys Phe His Phe
        115                 120                 125

ctt gaa aaa att aca gag aga caa gct gcc gct gct acg cgt gaa aca        432
Leu Glu Lys Ile Thr Glu Arg Gln Ala Ala Ala Ala Thr Arg Glu Thr
        130                 135                 140

ggt ttt gtg tta act gaa cca aaa gtc tac gga agg gac aaa gag gag        480
Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Asp Lys Glu Glu
145                 150                 155                 160

gat gag ata gtg aaa att ctg ata aac aat gtt aat gtt gcc gaa gaa        528
Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Asn Val Ala Glu Glu
                165                 170                 175

ctt cca gtc ttc cct ata att ggt atg ggg gga cta gga aag acg aca        576
Leu Pro Val Phe Pro Ile Ile Gly Met Gly Gly Leu Gly Lys Thr Thr
                180                 185                 190

ctt gcc caa atg atc ttc aac gat gag aga gta act aag cat ttc aat        624
Leu Ala Gln Met Ile Phe Asn Asp Glu Arg Val Thr Lys His Phe Asn
        195                 200                 205

ccc aaa ata tgg gtt tgt gtc tca gat gat ttt gat gag aag agg tta        672
Pro Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu
        210                 215                 220

att aag aca att ata gga aat att gaa aga agt tct cct cat gtt gag        720
Ile Lys Thr Ile Ile Gly Asn Ile Glu Arg Ser Ser Pro His Val Glu
225                 230                 235                 240

gac ttg gct tca ttt cag aag aag ctc cag gag tta ttg aat gga aaa        768
Asp Leu Ala Ser Phe Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys
                245                 250                 255

cga tac ttg ctt gtc tta gat gat gtt tgg aat gat gat cta gaa aag        816
Arg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Asp Asp Leu Glu Lys
                260                 265                 270

tgg gct aag tta aga gca gtc tta act gtt gga gca aga ggt gct tct        864
Trp Ala Lys Leu Arg Ala Val Leu Thr Val Gly Ala Arg Gly Ala Ser
        275                 280                 285

att cta gct act act cgt ctt gaa aag gtt gga tca att atg gga acg        912
Ile Leu Ala Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr
        290                 295                 300

ttg caa cca tat cat ttg tca aat ttg tct cca cat gat agt tta ctt        960
Leu Gln Pro Tyr His Leu Ser Asn Leu Ser Pro His Asp Ser Leu Leu
305                 310                 315                 320

ttg ttt atg caa cgc gca ttt ggg caa caa aaa gaa gca aat cct aat       1008
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                325                 330                 335

cta gtg gcc att gga aag gag att gtg aag aaa tgt ggt ggt gtg cct       1056
Leu Val Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro
                340                 345                 350

tta gca gcc aag act ctt ggt ggt ctt tta cgc ttc aag aga gaa gag       1104
Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu
        355                 360                 365
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agt gaa tgg gaa cat gtg aga gat aat gag att tgg agt ctg cct caa          1152
Ser Glu Trp Glu His Val Arg Asp Asn Glu Ile Trp Ser Leu Pro Gln
    370             375             380

gat gaa agt tct att ttg cct gct cta aga ctg agt tat cat cac ctt          1200
Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu
385             390             395             400

cca ctt gat ttg aga caa tgc ttt gcg tat tgt gca gta ttc cca aag          1248
Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys
            405             410             415

gac acc aaa atg ata aag gaa aat ctc att act ctc tgg atg gcg cat          1296
Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His
        420             425             430

ggt ttt ctt tta tca aag gga aac ttg gag cta gag gat gtg ggt aat          1344
Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn
        435             440             445

gaa gta tgg aat gaa tta tac ttg agg tct ttc ttc caa gaa att gaa          1392
Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu
    450             455             460

gct aaa tcg ggt aat act tat ttc aag ata cat gat cta atc cat gat          1440
Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp
465             470             475             480

ttg gct aca tct ctg ttt tcg gca agc gca tca tgc ggc aat atc cgc          1488
Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg
            485             490             495

gaa ata aat gtc aaa gat tat aag cat aca gtg tcc att ggt ttc gct          1536
Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ala
        500             505             510

gca gtg gtg tct tct tac tct cct tcg ctc ttg aaa aag ttt gtc tcg          1584
Ala Val Val Ser Ser Tyr Ser Pro Ser Leu Leu Lys Lys Phe Val Ser
        515             520             525

tta agg gtg ctt aat cta agt tac tca aaa ctt gag caa tta ccg tct          1632
Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser
    530             535             540

tcc att gga gat cta tta cat tta aga tac ctg gac ctg tct tgc aat          1680
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545             550             555             560

aac ttc cgt agt ctt cca gag agg ttg tgc aag ctt caa aat ctt cag          1728
Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln
            565             570             575

act ctt gat gta cat aat tgc tac tca ctt aat tgt ttg cca aaa caa          1776
Thr Leu Asp Val His Asn Cys Tyr Ser Leu Asn Cys Leu Pro Lys Gln
            580             585             590

aca agt aaa ctt agt agt ctc cga cat ctt gtt gtt gat ggc tgt cca          1824
Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro
        595             600             605

ttg act tct act cca cca agg ata gga ttg ttg aca tgc ctt aag act          1872
Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr
        610             615             620

cta ggt ttc ttt att gtg gga agc aag aaa ggt tat caa ctt ggt gaa          1920
Leu Gly Phe Phe Ile Val Gly Ser Lys Lys Gly Tyr Gln Leu Gly Glu
625             630             635             640

ctg aaa aac cta aat ctc tgc ggc tca att tca atc aca cac ctt gag          1968
Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu
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Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu
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aga gtg aag aac gat acg gat gca gaa gcc aat tta tct gca aaa gca    2016
Arg Val Lys Asn Asp Thr Asp Ala Glu Ala Asn Leu Ser Ala Lys Ala
            660             665             670

aat ctg caa tct tta agc atg agt tgg gat aac gat gga cca aac aga    2064
Asn Leu Gln Ser Leu Ser Met Ser Trp Asp Asn Asp Gly Pro Asn Arg
            675             680             685

tat gaa tcc aaa gaa gtt aaa gtg ctt gaa gca ctc aaa cca cac ccc    2112
Tyr Glu Ser Lys Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro
        690             695          .  700

aat ctg aaa tat tta gag atc att gcc ttc gga gga ttc cgt ttt cca    2160
Asn Leu Lys Tyr Leu Glu Ile Ile Ala Phe Gly Gly Phe Arg Phe Pro
705             710             715             720

agc tgg ata aat cac tca gtt ttg gag aag gtc atc tct gtt aga att    2208
Ser Trp Ile Asn His Ser Val Leu Glu Lys Val Ile Ser Val Arg Ile
            725             730             735

aaa agc tgc aaa aac tgc ttg tgc tta cca ccc ttt ggg gag ctt cct    2256
Lys Ser Cys Lys Asn Cys Leu Cys Leu Pro Pro Phe Gly Glu Leu Pro
            740             745             750

tgt cta gaa aat cta gag tta caa aac gga tct gcg gag gtg gag tat    2304
Cys Leu Glu Asn Leu Glu Leu Gln Asn Gly Ser Ala Glu Val Glu Tyr
            755             760             765

gtt gaa gag gat gat gtc cat tct aga ttc tcc aca aga aga agc ttt    2352
Val Glu Glu Asp Asp Val His Ser Arg Phe Ser Thr Arg Arg Ser Phe
        770             775             780

cca tcc ctg aaa aaa ctt cgt ata tgg ttc ttt cgc agt ttg aaa ggg    2400
Pro Ser Leu Lys Lys Leu Arg Ile Trp Phe Phe Arg Ser Leu Lys Gly
785             790             795             800

ctg atg aaa gag gaa gga gaa gag aaa ttc ccc atg ctt gaa gag atg    2448
Leu Met Lys Glu Glu Gly Glu Glu Lys Phe Pro Met Leu Glu Glu Met
            805             810             815

gcg att tta tat tgc cct ctg ttt gtt ttt cca acc ctt tct tct gtc    2496
Ala Ile Leu Tyr Cys Pro Leu Phe Val Phe Pro Thr Leu Ser Ser Val
            820             825             830

aag aaa tta gaa gtt cac ggc aac aca aac act aga ggt ttg agc tcc    2544
Lys Lys Leu Glu Val His Gly Asn Thr Asn Thr Arg Gly Leu Ser Ser
            835             840             845

ata tct aat ctt agc act ctt act tcc ctc cgc att ggt gct aac tac    2592
Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Arg Ile Gly Ala Asn Tyr
        850             855             860

aga gcg act tca ctc cca gaa gag atg ttc aca agt ctt aca aat ctc    2640
Arg Ala Thr Ser Leu Pro Glu Glu Met Phe Thr Ser Leu Thr Asn Leu
865             870             875             880

gaa ttc ttg agt ttc ttt gac ttc aag aat ctc aaa gat ctg cct acc    2688
Glu Phe Leu Ser Phe Phe Asp Phe Lys Asn Leu Lys Asp Leu Pro Thr
            885             890             895

agc ctg act agt ctc aat gct ttg aag cgt ctc caa att gaa agt tgt    2736
Ser Leu Thr Ser Leu Asn Ala Leu Lys Arg Leu Gln Ile Glu Ser Cys
            900             905             910

gac tca cta gag agt ttc cct gaa caa ggg cta gaa ggt tta act tca    2784
Asp Ser Leu Glu Ser Phe Pro Glu Gln Gly Leu Glu Gly Leu Thr Ser
        915             920             925
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ctc aca cag ttg ttt gtt aaa tac tgt aag atg cta aaa tgt tta ccc        2832
Leu Thr Gln Leu Phe Val Lys Tyr Cys Lys Met Leu Lys Cys Leu Pro
    930                 935                 940

gag gga ttg cag cac cta aca gcc ctc aca aat tta gga gtt tct ggt        2880
Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly
945                 950                 955                 ·960

tgt cca gaa gtg gaa aag cgc tgt gat aag gaa ata gga gaa gac tgg        2928
Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp
                965                 970                 975

cac aaa att gct cac att cca aat ctg gat att cat tag                    2967
His Lys Ile Ala His Ile Pro Asn Leu Asp Ile His
                980                 985
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<213>  Solanum bulbocastanum

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Met Ala Glu Ala Phe Leu Gln Val Leu Leu Glu Asn Leu Thr Ser Phe
1               5                   10                  15


Ile Gly Asp Lys Leu Val Leu Ile Phe Gly Phe Glu Lys Glu Cys Glu
            20                  25                  30


Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Leu Gln Asp Ala
            35                  40                  45


Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys
    50                  55                  60


Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys
65                  70                  75                  80


Asn Glu Ala Ile Arg Phe Glu Gln Ser Arg Leu Gly Phe Tyr His Pro
                85                  90                  95


Gly Ile Ile Asn Phe Arg His Lys Ile Gly Arg Arg Met Lys Glu Ile
            100                 105                 110


Met Glu Lys Leu Asp Ala Ile Ser Glu Glu Arg Arg Lys Phe His Phe
            115                 120                 125


Leu Glu Lys Ile Thr Glu Arg Gln Ala Ala Ala Ala Thr Arg Glu Thr
    130                 135                 140


Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Asp Lys Glu Glu
145                 150                 155                 160


Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Asn Val Ala Glu Glu
                165                 170                 175


Leu Pro Val Phe Pro Ile Ile Gly Met Gly Gly Leu Gly Lys Thr Thr
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180   185   190

Leu Ala Gln Met Ile Phe Asn Asp Glu Arg Val Thr Lys His Phe Asn
    195   200   205

Pro Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu
    210   215   220

Ile Lys Thr Ile Ile Gly Asn Ile Glu Arg Ser Ser Pro His Val Glu
225   230   235   240

Asp Leu Ala Ser Phe Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys
            245   250   255

Arg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Asp Asp Leu Glu Lys
        260   265   270

Trp Ala Lys Leu Arg Ala Val Leu Thr Val Gly Ala Arg Gly Ala Ser
    275   280   285

Ile Leu Ala Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr
    290   295   300

Leu Gln Pro Tyr His Leu Ser Asn Leu Ser Pro His Asp Ser Leu Leu
305   310   315   320

Leu Phe Met Gln Arg Ala Phe Gly Gln Gln Lys Glu Ala Asn Pro Asn
            325   330   335

Leu Val Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro
            340   345   350

Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu
    355   360   365

Ser Glu Trp Glu His Val Arg Asp Asn Glu Ile Trp Ser Leu Pro Gln
    370   375   380

Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu
385   390   395   400

Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys
            405   410   415

Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His
            420   425   430

Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn
        435   440   445

Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu
    450   455   460

Page 46

Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp
465   470   475   480

Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg
        485   490   495

Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ala
        500   505   510

Ala Val Val Ser Ser Tyr Ser Pro Ser Leu Leu Lys Lys Phe Val Ser
        515   520   525

Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser
    530   535   540

Ser Ile Gly Asp Leu Leu His Leu Arg Tyr Leu Asp Leu Ser Cys Asn
545   550   555   560

Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln
            565   570   575

Thr Leu Asp Val His Asn Cys Tyr Ser Leu Asn Cys Leu Pro Lys Gln
        580   585   590

Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro
    595   600   605

Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr
    610   615   620

Leu Gly Phe Phe Ile Val Gly Ser Lys Lys Gly Tyr Gln Leu Gly Glu
625   630   635   640

Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu
            645   650   655

Arg Val Lys Asn Asp Thr Asp Ala Glu Ala Asn Leu Ser Ala Lys Ala
            660   665   670

Asn Leu Gln Ser Leu Ser Met Ser Trp Asp Asn Asp Gly Pro Asn Arg
        675   680   685

Tyr Glu Ser Lys Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro
    690   695   700

Asn Leu Lys Tyr Leu Glu Ile Ile Ala Phe Gly Gly Phe Arg Phe Pro
705   710   715   720

Ser Trp Ile Asn His Ser Val Leu Glu Lys Val Ile Ser Val Arg Ile
            725   730   735

Lys Ser Cys Lys Asn Cys Leu Cys Leu Pro Pro Phe Gly Glu Leu Pro

                    740   745   750

Cys Leu Glu Asn Leu Glu Leu Gln Asn Gly Ser Ala Glu Val Glu Tyr
        755   760   765

Val Glu Glu Asp Asp Val His Ser Arg Phe Ser Thr Arg Arg Ser Phe
        770   775   780

Pro Ser Leu Lys Lys Leu Arg Ile Trp Phe Phe Arg Ser Leu Lys Gly
785   790   795   800

Leu Met Lys Glu Glu Gly Glu Glu Lys Phe Pro Met Leu Glu Glu Met
                805   810   815

Ala Ile Leu Tyr Cys Pro Leu Phe Val Phe Pro Thr Leu Ser Ser Val
                820   825   830

Lys Lys Leu Glu Val His Gly Asn Thr Asn Thr Arg Gly Leu Ser Ser
        835   840   845

Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Arg Ile Gly Ala Asn Tyr
        850   855   860

Arg Ala Thr Ser Leu Pro Glu Glu Met Phe Thr Ser Leu Thr Asn Leu
865   870   875   880

Glu Phe Leu Ser Phe Phe Asp Phe Lys Asn Leu Lys Asp Leu Pro Thr
                885   890   895

Ser Leu Thr Ser Leu Asn Ala Leu Lys Arg Leu Gln Ile Glu Ser Cys
                900   905   910

Asp Ser Leu Glu Ser Phe Pro Glu Gln Gly Leu Glu Gly Leu Thr Ser
        915   920   925

Leu Thr Gln Leu Phe Val Lys Tyr Cys Lys Met Leu Lys Cys Leu Pro
        930   935   940

Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly
945   950   955   960

Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp
                965   970   975

His Lys Ile Ala His Ile Pro Asn Leu Asp Ile His
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Met Ala Glu Ala Phe Ile Gln Val Val Leu Asp Asn Leu Thr Ser Phe
1               5                   10              ·   15

ctc aaa ggg gaa ctt gta ttg ctt ttc ggt ttt caa gat gag ttc caa        96
Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
                20                  25                  30

agg ctt tca agc atg ttt tct aca atc caa gcc gtc ctt gaa gat gct       144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
            35                  40                  45

caa gag aag caa ctc aac gac aag cct cta gaa aat tgg ttg caa aaa       192
Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys
        50                  55                  60

ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa       240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65                  70                  75                  80

act aag gcc aca aga ttc ttg ctg tct gaa tat ggc cgt tat cat cca       288
Thr Lys Ala Thr Arg Phe Leu Leu Ser Glu Tyr Gly Arg Tyr His Pro
                85                  90                  95

aag gtt atc cct ttc cgt cac aag gtt ggg aaa agg atg gac caa gtg       336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
                100                 105                 110

atg aaa aaa ctg aat gca att gct gag gaa cga aag aat ttt cat ttg       384
Met Lys Lys Leu Asn Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
            115                 120                 125

caa gaa aag att ata gag aga caa gct gct aca cgg gaa aca ggt tct       432
Gln Glu Lys Ile Ile Glu Arg Gln Ala Ala Thr Arg Glu Thr Gly Ser
        130                 135                 140

gtg tta act gaa tca caa gtt tat gga agg gac aaa gaa aaa gat gag       480
Val Leu Thr Glu Ser Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
145                 150                 155                 160

ata gtg aaa atc cta aca aac act gct agt gat gcc caa aaa ctc tca       528
Ile Val Lys Ile Leu Thr Asn Thr Ala Ser Asp Ala Gln Lys Leu Ser
                165                 170                 175

gtc ctc cca ata ctt ggt atg ggg gga cta gga aag acg act ctt tcc       576
Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ser
                180                 185                 190

caa atg gtc ttc aat gat cag aga gta act gag cgt ttc tat ccc aaa       624
Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu Arg Phe Tyr Pro Lys
            195                 200                 205

ata tgg att tgc gtc tcg gat gat ttt aat gag aag agg ttg ata aag       672
Ile Trp Ile Cys Val Ser Asp Asp Phe Asn Glu Lys Arg Leu Ile Lys
        210                 215                 220

gca ata gta gaa tct att gaa ggg aag tcc ctc agt gac atg gac ttg       720
Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Ser Asp Met Asp Leu
225                 230                 235                 240

gct cca ctt caa aag aag ctt caa gag ttg ctg aat gga aaa aga tac       768
Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr
                245                 250                 255

ttc ctt gtc tta gat gat gtt tgg aat gaa gat caa cat aag tgg gct       816
Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln His Lys Trp Ala
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aat tta aga gca gtc ttg aag gtt gga gca agt ggt gca ttt gtt cta    864
Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Phe Val Leu
        275                 280                 285

aca act act cgt ctt gaa aag gtt gga tca att atg gga aca ttg caa    912
Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu Gln
    290                 295                 300

cca tat gaa ttg tca aat ctg tct cca gag gat tgt tgg ttt ttg ttc    960
Pro Tyr Glu Leu Ser Asn Leu Ser Pro Glu Asp Cys Trp Phe Leu Phe
305                 310                 315                 320

atg cag cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt gtg   1008
Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu Val
                325                 330                 335

gca atc gga aag gag att gtg aaa aaa tgt ggt ggt gtg cct cta gca   1056
Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala
            340                 345                 350

gcc aag act ctt gga ggt att ttg cgc ttc aag aga gaa gaa aga gaa   1104
Ala Lys Thr Leu Gly Gly Ile Leu Arg Phe Lys Arg Glu Glu Arg Glu
        355                 360                 365

tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat gaa   1152
Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp Glu
    370                 375                 380

agt tct att ctg cct gcc ctg agg ctt agt tac cat cat ctt cca ctt   1200
Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
385                 390                 395                 400

gat ttg aga caa tgc ttt gtg tat tgt gcg gta ttc cca aag gac acc   1248
Asp Leu Arg Gln Cys Phe Val Tyr Cys Ala Val Phe Pro Lys Asp Thr
                405                 410                 415

aaa atg gca aag gaa aat ctt atc gct ttt tgg atg gca cat ggt ttt   1296
Lys Met Ala Lys Glu Asn Leu Ile Ala Phe Trp Met Ala His Gly Phe
            420                 425          .      430

ctt tta tcg aaa gga aat ttg gag cta gag gat gta ggt aat gaa gta   1344
Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn Glu Val
        435                 440                 445

tgg aat gaa tta tac ttg agg tct ttc ttc caa gag att gaa gtt gaa   1392
Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Glu
    450                 455                 460^

tct ggt aaa act tat ttc aag atg cat gac ctc atc cat gat ttg gct   1440
Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala
465                 470                 475                 480

acg tct ctg ttt tca gca aac aca tca agc agc aat att cgt gaa ata   1488
Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu Ile
                485                 490                 495

aat gct aat tat gat gga tat atg atg tcg att ggt ttc gct gaa gtg   1536
Asn Ala Asn Tyr Asp Gly Tyr Met Met Ser Ile Gly Phe Ala Glu Val
            500                 505                 510

gtg tct tct tac tct cct tca ctc ttg caa aag ttt gtc tca tta agg   1584
Val Ser Ser Tyr Ser Pro Ser Leu Leu Gln Lys Phe Val Ser Leu Arg
        515                 520                 525

gtg ctt aat cta aga aac tcg aac cta aat caa tta cca tct tcc att   1632
Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile
    530                 535                 540
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gga gat cta gta cat tta aga tac ctg gac ttg tct ggc aat gtt aga    1680
Gly Asp Leu Val His Leu Arg Tyr Leu Asp Leu Ser Gly Asn Val Arg
545                 550                 555                 560

att cgt agt ctt cca agg aga tta tgc aag ctt caa aat ctg cag act    1728
Ile Arg Ser Leu Pro Arg Arg Leu Cys Lys Leu Gln Asn Leu Gln Thr
                565                 570                 575

ctt gat cta cat tat tgc gac tct ctt tct tgt ttg cca aaa caa aca    1776
Leu Asp Leu His Tyr Cys Asp Ser Leu Ser Cys Leu Pro Lys Gln Thr
                580                 585                 590

agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggc tgt tca ttg    1824
Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Cys Ser Leu
            595                 600                 605

acg tca acg cca cca agg ata gga ttg ttg aca tgc ctt aag tct cta    1872
Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Ser Leu
    610                 615                 620

agt tgc ttt gtt att ggc aag aga aag gtt atc aac ttg gtg aac taa    1920
Ser Cys Phe Val Ile Gly Lys Arg Lys Val Ile Asn Leu Val Asn
625                 630                 635
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<213>   Solanum bulbocastanum

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Met Ala Glu Ala Phe Ile Gln Val Val Leu Asp Asn Leu Thr Ser Phe
1               5                   10                  15

Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
            20                  25                  30

Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
            35                  40                  45

Gln Glu Lys Gln Leu Asn Asp Lys Pro Leu Glu Asn Trp Leu Gln Lys
    50                  55                  60

Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65                  70                  75                  80

Thr Lys Ala Thr Arg Phe Leu Leu Ser Glu Tyr Gly Arg Tyr His Pro
            85                  90                  95

Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
            100                 105                 110

Met Lys Lys Leu Asn Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
            115                 120                 125

Gln Glu Lys Ile Ile Glu Arg Gln Ala Ala Thr Arg Glu Thr Gly Ser
    130                 135                 140

Val Leu Thr Glu Ser Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
145                 150                 155                 160
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Ile Val Lys Ile Leu Thr Asn Thr Ala Ser Asp Ala Gln Lys Leu Ser
                165   170   175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ser
                180   185   190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu Arg Phe Tyr Pro Lys
            195   200   205

Ile Trp Ile Cys Val Ser Asp Asp Phe Asn Glu Lys Arg Leu Ile Lys
    210   215   220

Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu Ser Asp Met Asp Leu
225   230   235   240

Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg Tyr
                245   250   255

Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln His Lys Trp Ala
                260   265   270

Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Phe Val Leu
        275   280   285

Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu Gln
    290   295   300

Pro Tyr Glu Leu Ser Asn Leu Ser Pro Glu Asp Cys Trp Phe Leu Phe
305   310   315   320

Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu Val
                325   330   335

Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro Leu Ala
            340   345   350

Ala Lys Thr Leu Gly Gly Ile Leu Arg Phe Lys Arg Glu Glu Arg Glu
            355   360   365

Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp Glu
    370   375   380

Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu Pro Leu
385   390   395   400

Asp Leu Arg Gln Cys Phe Val Tyr Cys Ala Val Phe Pro Lys Asp Thr
                405   410   415

Lys Met Ala Lys Glu Asn Leu Ile Ala Phe Trp Met Ala His Gly Phe
            420   425   430

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Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn Glu Val
        435             440             445

Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val Glu
        450             455             460

Ser Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu Ala
465             470             475             480

Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu Ile
            485             490             495

Asn Ala Asn Tyr Asp Gly Tyr Met Met Ser Ile Gly Phe Ala Glu Val
            500             505             510

Val Ser Ser Tyr Ser Pro Ser Leu Leu Gln Lys Phe Val Ser Leu Arg
        515             520             525

Val Leu Asn Leu Arg Asn Ser Asn Leu Asn Gln Leu Pro Ser Ser Ile
    530             535             540

Gly Asp Leu Val His Leu Arg Tyr Leu Asp Leu Ser Gly Asn Val Arg
545             550             555             560

Ile Arg Ser Leu Pro Arg Arg Leu Cys Lys Leu Gln Asn Leu Gln Thr
            565             570             575

Leu Asp Leu His Tyr Cys Asp Ser Leu Ser Cys Leu Pro Lys Gln Thr
        580             585             590

Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Leu Asp Gly Cys Ser Leu
        595             600             605

Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Ser Leu
    610             615             620

Ser Cys Phe Val Ile Gly Lys Arg Lys Val Ile Asn Leu Val Asn
625             630             635
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<213>  Solanum bulbocastanum

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1               5               10              15

tat gga agg gac aaa gaa aag gac gag ata gtg aaa atc ctg ata aac      96
Tyr Gly Arg Asp Lys Glu Lys Asp Glu Ile Val Lys Ile Leu Ile Asn
            20              25              30
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aat gtt agt gat gct caa gaa gtt tca gtc ctc cca ata gtt ggt atg      144
Asn Val Ser Asp Ala Gln Glu Val Ser Val Leu Pro Ile Val Gly Met
        35                  40                  45

ggg gga cta gga aag acg act ctt gcc caa atg gtc ttc aat gat cag      192
Gly Gly Leu Gly Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln
        50                  55                  60

aca gta act gag cat ttg tat ccg aaa ata tgg att tgt gtc tcc aat      240
Thr Val Thr Glu His Leu Tyr Pro Lys Ile Trp Ile Cys Val Ser Asn
65                  70                  75                  80

gat ttt gat gag aag agg tta ata aag gca att gta gaa tct att gaa      288
Asp Phe Asp Glu Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu
                85                  90                  95

gga agg cca cta ctt ggt gag atg gac ttg gct cca ctt caa aag aag      336
Gly Arg Pro Leu Leu Gly Glu Met Asp Leu Ala Pro Leu Gln Lys Lys
            100                 105                 110

ctt caa gag ttg cgg atg tgg agt atg ttg aag aag tgg ata ttg atg      384
Leu Gln Glu Leu Arg Met Trp Ser Met Leu Lys Lys Trp Ile Leu Met
        115                 120                 125

ttc att ctg gat ttc ccc aca aga ata agg ttt cca tcc ttg agg aaa      432
Phe Ile Leu Asp Phe Pro Thr Arg Ile Arg Phe Pro Ser Leu Arg Lys
        130                 135                 140

ctt gat ata tgg gac ttt ggt agt ctg aaa gga ttg ctg aaa aag gaa      480
Leu Asp Ile Trp Asp Phe Gly Ser Leu Lys Gly Leu Leu Lys Lys Glu
145                 150                 155                 160

gga gaa gag caa ttc cct gtg ctt gaa gag atg gag att aaa tgg tgc      528
Gly Glu Glu Gln Phe Pro Val Leu Glu Glu Met Glu Ile Lys Trp Cys
                165                 170                 175

cct atg ttt gtt att ccg acc ctt tct tct gtc aag aaa ttg gta gtt      576
Pro Met Phe Val Ile Pro Thr Leu Ser Ser Val Lys Lys Leu Val Val
            180                 185                 190

cgt ggg gac aag tca gat gca ata ggt ttc agt tcc ata tct aat ctc      624
Arg Gly Asp Lys Ser Asp Ala Ile Gly Phe Ser Ser Ile Ser Asn Leu
            195                 200                 205

agg gct ctt act tcc ctc aat att aac ttt aac aaa gaa gct act tca      672
Arg Ala Leu Thr Ser Leu Asn Ile Asn Phe Asn Lys Glu Ala Thr Ser
210                 215                 220

ctc cca gaa gag atg ttc aaa agc ctt gca aat ctc aaa tac ttg aaa      720
Leu Pro Glu Glu Met Phe Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys
225                 230                 235                 240

atc tct tcc ttt agg aat ctc aaa gag ctg cct acc agc ctg gct agt      768
Ile Ser Ser Phe Arg Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser
                245                 250                 255

ctc aat gct ttg cag agt ctg aca att gaa cat tgt gac gca cta gag      816
Leu Asn Ala Leu Gln Ser Leu Thr Ile Glu His Cys Asp Ala Leu Glu
            260                 265                 270

agt ctc cca gaa gaa ggg gtg aaa ggt tta act tca ctc acc gag ttg      864
Ser Leu Pro Glu Glu Gly Val Lys Gly Leu Thr Ser Leu Thr Glu Leu
            275                 280                 285

tct gtc cag gac tga                                                  879
Ser Val Gln Asp
            290
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<210> 16
<211> 292
<212> PRT
<213> Solanum bulbocastanum

<400> 16

Met Trp Thr Leu Leu Gly Pro Gly Ser Val Leu Thr Glu Pro Gln Val
1   5   10   15

Tyr Gly Arg Asp Lys Glu Lys Asp Glu Ile Val Lys Ile Leu Ile Asn
            20   25   30

Asn Val Ser Asp Ala Gln Glu Val Ser Val Leu Pro Ile Val Gly Met
            35   40   45

Gly Gly Leu Gly Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln
    50   55   60

Thr Val Thr Glu His Leu Tyr Pro Lys Ile Trp Ile Cys Val Ser Asn
65   70   75   80

Asp Phe Asp Glu Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu
            85   90   95

Gly Arg Pro Leu Leu Gly Glu Met Asp Leu Ala Pro Leu Gln Lys Lys
            100   105   110

Leu Gln Glu Leu Arg Met Trp Ser Met Leu Lys Lys Trp Ile Leu Met
            115   120   125

Phe Ile Leu Asp Phe Pro Thr Arg Ile Arg Phe Pro Ser Leu Arg Lys
    130   135   140

Leu Asp Ile Trp Asp Phe Gly Ser Leu Lys Gly Leu Leu Lys Lys Glu
145   150   155   160

Gly Glu Glu Gln Phe Pro Val Leu Glu Glu Met Glu Ile Lys Trp Cys
                165   170   175

Pro Met Phe Val Ile Pro Thr Leu Ser Ser Val Lys Lys Leu Val Val
                180   185   190

Arg Gly Asp Lys Ser Asp Ala Ile Gly Phe Ser Ser Ile Ser Asn Leu
            195   200   205

Arg Ala Leu Thr Ser Leu Asn Ile Asn Phe Asn Lys Glu Ala Thr Ser
    210   215   220

Leu Pro Glu Glu Met Phe Lys Ser Leu Ala Asn Leu Lys Tyr Leu Lys
225   230   235   240

Ile Ser Ser Phe Arg Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser
                245   250   255

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Leu Asn Ala Leu Gln Ser Leu Thr Ile Glu His Cys Asp Ala Leu Glu
            260                 265             270

Ser Leu Pro Glu Glu Gly Val Lys Gly Leu Thr Ser Leu Thr Glu Leu
            275             280             285

Ser Val Gln Asp
            290


<210>  17
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<213>  Solanum bulbocastanum


<220>
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<222>  (1)..(1362)

<400>  17
atg gct gaa gct ttc att caa gtt ctg tta gac aat ctc act tct ttc      48
Met Ala Glu Ala Phe Ile Gln Val Leu Leu Asp Asn Leu Thr Ser Phe
1               5                   10                  15

ctc aaa ggg gaa ctt gca ttg ctt ttc ggt ttt caa gat gag ttc caa      96
Leu Lys Gly Glu Leu Ala Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
                20                  25                  30

agg ctt tca agc atg ttt tct aca att caa gcc gtc ctt gaa gat gct     144
Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
            35                  40                  45

cag gag aag caa ctc aac aac aag cct cta gaa aat tgg ttg caa aaa     192
Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys
        50                  55                  60

ctc aat gct gct aca tat gaa gtc gat gac atc ttg gat gaa tat aaa     240
Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65                  70                  75                  80

acc aag gcc aca aga ttc tcc cag tct gaa tat ggc cgt tat cat cca     288
Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro
                85                  90                  95

aag gtt atc cct ttc cgt cac aag gtc ggg aaa agg atg gac caa gtg     336
Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
                100                 105                 110

atg aaa aaa cta aag gca att gct gag gaa aga aag aat ttt cat ttg     384
Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
            115                 120                 125

cac gaa aaa att gta gag aga caa gct gtt aga cgg gaa aca ggt tct     432
His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser
        130                 135                 140

gta tta acc gaa ccg cag gtt tat gga aga gac aaa gag aaa gat gag     480
Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
145                 150                 155                 160

ata gtg aaa atc cta ata aac aat gtt agt gat gcc caa cac ctt tca     528
Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser
                165                 170                 175

gtc ctc cca ata ctt ggt atg ggg gga tta gga aaa acg act ctt gcc     576
Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
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                180                         185                         190

caa atg gtc ttc aat gac cag aga gtt act gag cat ttc cat tcc aaa          624
Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys
        195                         200                     205

ata tgg att tgt gtc tcg gaa gat ttt gat gag aag agg tta ata aag          672
Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys
        210                         215                     220

gca att gta gaa tct att gaa gga agg cca cta ctt ggt gag atg gac          720
Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp
225                         230                     235                 240

ttg gct cca ctt caa aag aag ctt cag gag ttg ctg aat gga aaa aga          768
Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg
                    245                     250                 255

tac ttg ctt gtc tta gat gat gtt tgg aat gaa gat caa cag aag tgg          816
Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp
                260                     265                 270

gct aat tta aga gca gtc ttg aag gtt gga gca agt ggt gct tct gtt          864
Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val
                275                     280                 285

cta acc act act cgt ctt gaa aag gtt gga tca att atg gga aca ttg          912
Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu
        290                         295                 300

caa cca tat gaa ctg tca aat ctg tct caa gaa gat tgt tgg ttg ttg          960
Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu
305                         310                     315                 320

ttc atg caa cgt gca ttt gga cac caa gaa gaa ata aat cca aac ctt         1008
Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu
                325                         330                 335

gtg gca atc gga aag gag att gtg aaa aaa agt ggt ggt gtg cct cta         1056
Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu
                340                         345                 350

gca gcc aaa act ctt gga ggt att ttg tgc ttc aag aga gaa gaa aga         1104
Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg
                355                         360                 365

gca tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat         1152
Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp
        370                         375                 380

gaa agt tct att ctg cct gcc ctg agg ctt agt tac cat caa ctt cca         1200
Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro
385                         390                     395                 400

ctt gat ttg aaa caa tgc ttt gcg tat tgt gcg gtg ttc cca aag gat         1248
Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp
                405                         410                 415

gcc aaa atg gaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt         1296
Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly
                420                         425                 430

ttt ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc gat gaa         1344
Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu
                435                         440                 445

gta tgg aaa gaa tta tag                                                 1362
Val Trp Lys Glu Leu
                450
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<210> 18
<211> 453
<212> PRT
<213> Solanum bulbocastanum

<400> 18

Met Ala Glu Ala Phe Ile Gln Val Leu Leu Asp Asn Leu Thr Ser Phe
1   5   10   15

Leu Lys Gly Glu Leu Ala Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln
            20   25   30

Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala
        35   40   45

Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys
    50   55   60

Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys
65   70   75   80

Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro
                85   90   95

Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val
            100   105   110

Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu
        115   120   125

His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser
    130   135   140

Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu
145   150   155   160

Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser
            165   170   175

Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala
            180   185   190

Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys
        195   200   205

Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys
    210   215   220

Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp
225   230   235   240

Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg
            245   250   255

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Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp
        260             265             270


Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val
        275             280             285


Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu
        290      .        295             300


Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu
305             310             315             320


Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu
            325             330             335


Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu
        340             345             350


Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg
        355             360             365


Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp
    370             375             380


Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro
385             390             395             400


Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp
            405             410      .        415


Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly
            420             425             430


Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu
        435             440             445


Val Trp Lys Glu Leu
    450


<210>  19
<211>  3096
<212>  DNA
<213>  Solanum bulbocastanum


<220>
<221>  CDS
<222>  (1)..(3096)

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atg tgg cta tcc act ttt cca act gca ctg gca gtt gct gtt tca gtc          48
Met Trp Leu Ser Thr Phe Pro Thr Ala Leu Ala Val Ala Val Ser Val
1               5               10              15

cct tcc tct ctt act cca cag gat ttc agc tgg aga aag ttt aaa ttg          96
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                              Pro Ser Ser Leu Thr Pro Gln Asp Phe Ser Trp Arg Lys Phe Lys Leu
                                      20                      25                  30

aag aga aat gtg aag att tca aga aat ttt gaa ttt gct atc agt tgt       144
Lys Arg Asn Val Lys Ile Ser Arg Asn Phe Glu Phe Ala Ile Ser Cys
        35                  40                  45

tct ggt gat aga gct gct tca att ggg ttt gat gtg cca ttc cct aag       192
Ser Gly Asp Arg Ala Ala Ser Ile Gly Phe Asp Val Pro Phe Pro Lys
    50                  55                  60

gac tac act gaa tta ctt caa caa gta ttc att cta ttt gct ttt tct       240
Asp Tyr Thr Glu Leu Leu Gln Gln Val Phe Ile Leu Phe Ala Phe Ser
65                  70                  75                  80

ccc ctt aaa att ggg ggt gac ggt gag ggt gga ata gaa atg act gga       288
Pro Leu Lys Ile Gly Gly Asp Gly Glu Gly Gly Ile Glu Met Thr Gly
                    85                  90                  95

agt ata caa ctc ata cgt gag ttc tgt gat ctc ttg gta ata cct gag       336
Ser Ile Gln Leu Ile Arg Glu Phe Cys Asp Leu Leu Val Ile Pro Glu
                100                 105                 110

aaa gcc aca aag acc aga att ttt ttc ccg gag gct aat gaa gtg aaa       384
Lys Ala Thr Lys Thr Arg Ile Phe Phe Pro Glu Ala Asn Glu Val Lys
            115                 120                 125

ttt gca aga caa tca att ttt gga gga gca tct ttt aag ttg gac tat       432
Phe Ala Arg Gln Ser Ile Phe Gly Gly Ala Ser Phe Lys Leu Asp Tyr
        130                 135                 140

ttg aca aag cct tct ttt ttc gag gat ttc ggt ttc act gaa aag gtc       480
Leu Thr Lys Pro Ser Phe Phe Glu Asp Phe Gly Phe Thr Glu Lys Val
145                 150                 155                 160

aag atg gct gac cgt gtc aag cca gaa gat gaa ctc ttt ata gtc gcc       528
Lys Met Ala Asp Arg Val Lys Pro Glu Asp Glu Leu Phe Ile Val Ala
                165                 170                 175

tat cca tat ttt aat gtc aat ggg gaa ctt gga ttg gtt ttt ggt ttc       576
Tyr Pro Tyr Phe Asn Val Asn Gly Glu Leu Gly Leu Val Phe Gly Phe
                180                 185                 190

gag aag gag ttt aaa aaa ctt tca agt atg ttt tca atg atc caa gct       624
Glu Lys Glu Phe Lys Lys Leu Ser Ser Met Phe Ser Met Ile Gln Ala
            195                 200                 205

gtg cta gaa gat gct caa gag aag caa ctg aag tac aag gca ata aag       672
Val Leu Glu Asp Ala Gln Glu Lys Gln Leu Lys Tyr Lys Ala Ile Lys
        210                 215                 220

aac tgg tta cag aaa ctc aat gtt gct gca tat gaa gtt gat gac atc       720
Asn Trp Leu Gln Lys Leu Asn Val Ala Ala Tyr Glu Val Asp Asp Ile  .
225                 230                 235                 240

ttg gat gac tgt aaa act gag gca gca aga ttc aag cag gct gta ttg       768
Leu Asp Asp Cys Lys Thr Glu Ala Ala Arg Phe Lys Gln Ala Val Leu
                245                 250                 255

ggg cgt tat cat cca cgg acc atc act ttc tgt tac aag gtg gga aaa       816
Gly Arg Tyr His Pro Arg Thr Ile Thr Phe Cys Tyr Lys Val Gly Lys
                260                 265                 270

aga atg aaa gaa atg atg gaa aaa cta gat gca att gca gag gaa cgg       864
Arg Met Lys Glu Met Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg
            275                 280                 285

agg aat ttt cat tta gat gaa agg att ata gag aga caa gct gct aga       912
Arg Asn Phe His Leu Asp Glu Arg Ile Ile Glu Arg Gln Ala Ala Arg
    290                 295                 300
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cgg caa aca ggt ttt gtt tta act gag cca aaa gtt tat gga aag gaa    960
Arg Gln Thr Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Lys Glu
305             310             315             320

aaa gag gag gat gag ata gtg aaa atc ttg ata aac aat gtt agt tat    1008
Lys Glu Glu Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr
                325             330             335

tcc aaa gaa gtt cca gta ctc cca ata ctt ggt atg ggg gga cta gga    1056
Ser Lys Glu Val Pro Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly
                340             345             350

aag acg act cta gcc caa atg gtc ttc aat gat caa aga att act gag    1104
Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu
            355             360             365

cat ttc aat cta aag ata tgg gtt tgt gtc tca gat gat ttt gat gag    1152
His Phe Asn Leu Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu
        370             375             380

aag agg ttg att aag gca att gta gaa tct att gaa gga aag tca ctg    1200
Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu
385             390             395             400

ggt gac atg gac ttg gct ccc ctc cag aaa aag ctt cag gag ttg ttg    1248
Gly Asp Met Asp Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu
                405             410             415

aat gga aaa aga tac ttt ctt gtt ttg gat gat gtt tgg aat gaa gat    1296
Asn Gly Lys Arg Tyr Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp
                420             425             430

caa gaa aag tgg gat aat ctt aga gca gta ttg aag att gga gct agt    1344
Gln Glu Lys Trp Asp Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser
            435             440             445

ggt gct tca att cta att act act cgt ctt gaa aaa att gga tca att    1392
Gly Ala Ser Ile Leu Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile
        450             455             460

atg gga act ttg caa cta tat cag tta tca aat ttg tct caa gaa gat    1440
Met Gly Thr Leu Gln Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp
465             470             475             480

tgt tgg ttg ttg ttc aag caa cgt gca ttt tgc cac caa acc gaa aca    1488
Cys Trp Leu Leu Phe Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr
                485             490             495

agt cct aaa ctt atg gaa atc gga aag gag att gtg aag aaa tgt ggg    1536
Ser Pro Lys Leu Met Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly
                500             505             510

ggt gtg cct cta gca gcc aaa act ctt gga ggc ctt tta cgc ttc aag    1584
Gly Val Pro Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys
            515             520             525

agg gaa gaa agt gaa tgg gaa cat gtg aga gat agt gag att tgg aat    1632
Arg Glu Glu Ser Glu Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn
        530             535             540

tta cct caa gat gaa aat tct gtt ttg cct gcc ctg agg ctg agt tat    1680
Leu Pro Gln Asp Glu Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr
545             550             555             560

cat cat ctt cca ctt gat ttg aga caa tgt ttt gca tat tgc gca gta    1728
His His Leu Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val
                565             570             575

ttc cca aag gac acc aaa ata gaa aag gaa tat ctc atc gct ctc tgg    1776
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Phe Pro Lys Asp Thr Lys Ile Glu Lys Glu Tyr Leu Ile Ala Leu Trp
        580             585             590

atg gca cac agt ttt ctt tta tca aaa gga aac atg gag cta gag gat   1824
Met Ala His Ser Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp
        595             600             605

gtg ggc aat gaa gta tgg aat gaa tta tac ttg agg tct ttt ttc caa   1872
Val Gly Asn Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln
    610             615             620

gag att gaa gtt aaa tct gca agc gca tca agc aga agt atc cgc caa   1920
Glu Ile Glu Val Lys Ser Ala Ser Ala Ser Ser Arg Ser Ile Arg Gln
625             630             635             640

ata aat gta aaa gat gat gaa gat atg atg ttc att gta aca aat tat   1968
Ile Asn Val Lys Asp Asp Glu Asp Met Met Phe Ile Val Thr Asn Tyr
            645             650             655

aaa gat atg atg tcc att ggt tct ccg aag tgg tgt ctt ctt act ctc   2016
Lys Asp Met Met Ser Ile Gly Ser Pro Lys Trp Cys Leu Leu Thr Leu
        660             665             670

ctt cgc tct tta aaa ggc gag agg aaa ggt tat caa ctt ggt gaa cta   2064
Leu Arg Ser Leu Lys Gly Glu Arg Lys Gly Tyr Gln Leu Gly Glu Leu
        675             680             685

cga aat tta aac ctc cgt ggt gca att tca atc aca cat ctt gag aga   2112
Arg Asn Leu Asn Leu Arg Gly Ala Ile Ser Ile Thr His Leu Glu Arg
    690             695             700

gtg aaa aac gat atg gag gca aaa gaa gcc aat tta tct gca aaa gca   2160
Val Lys Asn Asp Met Glu Ala Lys Glu Ala Asn Leu Ser Ala Lys Ala
705             710             715             720

aat cta cac tct tta agc atg agt tgg gat aga cca aac aga tat gaa   2208
Asn Leu His Ser Leu Ser Met Ser Trp Asp Arg Pro Asn Arg Tyr Glu
            725             730             735

tcc gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cat ccc aat ctg   2256
Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro Asn Leu
            740             745             750

aaa tat tta gaa atc att gac ttc tgt gga ttc tgt ctc cct gac tgg   2304
Lys Tyr Leu Glu Ile Ile Asp Phe Cys Gly Phe Cys Leu Pro Asp Trp
        755             760             765

atg aat cac tca gtt ttg aaa aat gtt gtc tct att cta att agc ggt   2352
Met Asn His Ser Val Leu Lys Asn Val Val Ser Ile Leu Ile Ser Gly
        770             775             780

tgt gaa aac tgc tcg tgc tta cca ccc ttt ggt gag ctg cct tgt cta   2400
Cys Glu Asn Cys Ser Cys Leu Pro Pro Phe Gly Glu Leu Pro Cys Leu
785             790             795             800

gaa agt ctg gag tta caa gat ggg tct gtg gag gtg gag ttt gtt gaa   2448
Glu Ser Leu Glu Leu Gln Asp Gly Ser Val Glu Val Glu Phe Val Glu
            805             810             815

gat tct gga ttc ccg aca aga aga aga ttt cca tcc ctg aga aaa ctt   2496
Asp Ser Gly Phe Pro Thr Arg Arg Arg Phe Pro Ser Leu Arg Lys Leu
        820             825             830

cat ata ggt ggc ttt tgt aat ctg aaa gga ttg cag aga atg gaa gga   2544
His Ile Gly Gly Phe Cys Asn Leu Lys Gly Leu Gln Arg Met Glu Gly
        835             840             845

gaa gag caa ttc ccc gtg ctt gaa gag atg aag att tcg gat tgc cct   2592
Glu Glu Gln Phe Pro Val Leu Glu Glu Met Lys Ile Ser Asp Cys Pro
850             855             860
```

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atg ttt gtt ttt ccg acc ctt tct tct gtc aag aaa tta gaa att tgg      2640
Met Phe Val Phe Pro Thr Leu Ser Ser Val Lys Lys Leu Glu Ile Trp
865                 870                 875                 880

ggg gag gca gat gca aga ggt ttg agc tcc ata tct aat ctc agc act      2688
Gly Glu Ala Asp Ala Arg Gly Leu Ser Ser Ile Ser Asn Leu Ser Thr
                885                 890                 895

ctt aca tcc ctc aaa att ttc agt aac cac aca gtg act tca cta ctg      2736
Leu Thr Ser Leu Lys Ile Phe Ser Asn His Thr Val Thr Ser Leu Leu
                900                 905                 910

gaa gag atg ttc aaa agc ctc gaa aat ctc aaa tac ttg agt gtc tct      2784
Glu Glu Met Phe Lys Ser Leu Glu Asn Leu Lys Tyr Leu Ser Val Ser
            915                 920                 925

tac ttg gag aat ctc aaa gag ctg cct acc agc ctg gct agt ctc aat      2832
Tyr Leu Glu Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser Leu Asn
        930                 935                 940

aat ttg aag tgt ctg gat att cgt tat tgt tac gca cta gag agt ctc      2880
Asn Leu Lys Cys Leu Asp Ile Arg Tyr Cys Tyr Ala Leu Glu Ser Leu
945                 950                 955                 960

ccc gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag tta ttt gtt      2928
Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu Leu Phe Val
                965                 970                 975

gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg cag cac cta      2976
Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu Gln His Leu
                980                 985                 990

aca acc ctc aca agt tta aaa att  cgg gga tgt cca caa  ctg atc aag     3024
Thr Thr Leu Thr Ser Leu Lys Ile  Arg Gly Cys Pro Gln  Leu Ile Lys
            995                 1000                1005

cgg tgt  gag aag gga ata gga  gaa gac tgg cac aaa  att tct cac        3069
Arg Cys  Glu Lys Gly Ile Gly  Glu Asp Trp His Lys  Ile Ser His
    1010                1015                1020

att cct  aac gtg aat ata tat  att taa                                  3096
Ile Pro  Asn Val Asn Ile Tyr  Ile
    1025                1030
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<210> 20
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<213> Solanum bulbocastanum

<400> 20

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Met Trp Leu Ser Thr Phe Pro Thr Ala Leu Ala Val Ala Val Ser Val
1               5                   10                  15

Pro Ser Ser Leu Thr Pro Gln Asp Phe Ser Trp Arg Lys Phe Lys Leu
            20                  25                  30

Lys Arg Asn Val Lys Ile Ser Arg Asn Phe Glu Phe Ala Ile Ser Cys
        35                  40                  45

Ser Gly Asp Arg Ala Ala Ser Ile Gly Phe Asp Val Pro Phe Pro Lys
    50                  55                  60

Asp Tyr Thr Glu Leu Leu Gln Gln Val Phe Ile Leu Phe Ala Phe Ser
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65   ·   70   75   80

Pro Leu Lys Ile Gly Gly Asp Gly Glu Gly Gly Ile Glu Met Thr Gly
85   90   95

Ser Ile Gln Leu Ile Arg Glu Phe Cys Asp Leu Leu Val Ile Pro Glu
100   105   110

Lys Ala Thr Lys Thr Arg Ile Phe Phe Pro Glu Ala Asn Glu Val Lys
115   120   125

Phe Ala Arg Gln Ser Ile Phe Gly Gly Ala Ser Phe Lys Leu Asp Tyr
130   135   140

Leu Thr Lys Pro Ser Phe Phe Glu Asp Phe Gly Phe Thr Glu Lys Val
145   150   155   160

Lys Met Ala Asp Arg Val Lys Pro Glu Asp Glu Leu Phe Ile Val Ala
165   170   175

Tyr Pro Tyr Phe Asn Val Asn Gly Glu Leu Gly Leu Val Phe Gly Phe
180   185   190

Glu Lys Glu Phe Lys Lys Leu Ser Ser Met Phe Ser Met Ile Gln Ala
195   200   205

Val Leu Glu Asp Ala Gln Glu Lys Gln Leu Lys Tyr Lys Ala Ile Lys
210   215   220

Asn Trp Leu Gln Lys Leu Asn Val Ala Ala Tyr Glu Val Asp Asp Ile
225   230   235   240

Leu Asp Asp Cys Lys Thr Glu Ala Ala Arg Phe Lys Gln Ala Val Leu
245   250   255

Gly Arg Tyr His Pro Arg Thr Ile Thr Phe Cys Tyr Lys Val Gly Lys
260   265   270

Arg Met Lys Glu Met Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg
275   280   285

Arg Asn Phe His Leu Asp Glu Arg Ile Ile Glu Arg Gln Ala Ala Arg
290   295   300

Arg Gln Thr Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Lys Glu
305   310   315   320

Lys Glu Glu Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Ser Tyr
325   330   335

Ser Lys Glu Val Pro Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly
340   345   350

Lys Thr Thr Leu Ala Gln Met Val Phe Asn Asp Gln Arg Ile Thr Glu
    355   360   365

His Phe Asn Leu Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu
    370   375   380

Lys Arg Leu Ile Lys Ala Ile Val Glu Ser Ile Glu Gly Lys Ser Leu
385   390   395   400

Gly Asp Met Asp Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu
            405   410   415

Asn Gly Lys Arg Tyr Phe Leu Val Leu Asp Asp Val Trp Asn Glu Asp
        420   425   430

Gln Glu Lys Trp Asp Asn Leu Arg Ala Val Leu Lys Ile Gly Ala Ser
    435   440   445

Gly Ala Ser Ile Leu Ile Thr Thr Arg Leu Glu Lys Ile Gly Ser Ile
    450   455   460

Met Gly Thr Leu Gln Leu Tyr Gln Leu Ser Asn Leu Ser Gln Glu Asp
465   470   475   480

Cys Trp Leu Leu Phe Lys Gln Arg Ala Phe Cys His Gln Thr Glu Thr
            485   490   495

Ser Pro Lys Leu Met Glu Ile Gly Lys Glu Ile Val Lys Lys Cys Gly
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Gly Val Pro Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys
        515   520   525

Arg Glu Glu Ser Glu Trp Glu His Val Arg Asp Ser Glu Ile Trp Asn
    530   535   540

Leu Pro Gln Asp Glu Asn Ser Val Leu Pro Ala Leu Arg Leu Ser Tyr
545   550   555   560

His His Leu Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val
            565   570   575

Phe Pro Lys Asp Thr Lys Ile Glu Lys Glu Tyr Leu Ile Ala Leu Trp
            580   585   590

Met Ala His Ser Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp
        595   600   605

Val Gly Asn Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln
    610   615   620

Glu Ile Glu Val Lys Ser Ala Ser Ala Ser Ser Arg Ser Ile Arg Gln

625   630   635   640

Ile Asn Val Lys Asp Asp Glu Asp Met Met Phe Ile Val Thr Asn Tyr
            645   650   655

Lys Asp Met Met Ser Ile Gly Ser Pro Lys Trp Cys Leu Leu Thr Leu
            660   665   670

Leu Arg Ser Leu Lys Gly Glu Arg Lys Gly Tyr Gln Leu Gly Glu Leu
            675   680   685

Arg Asn Leu Asn Leu Arg Gly Ala Ile Ser Ile Thr His Leu Glu Arg
    690   695   700

Val Lys Asn Asp Met Glu Ala Lys Glu Ala Asn Leu Ser Ala Lys Ala
705   710   715   720

Asn Leu His Ser Leu Ser Met Ser Trp Asp Arg Pro Asn Arg Tyr Glu
            725   730   735

Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro Asn Leu
            740   745   750

Lys Tyr Leu Glu Ile Ile Asp Phe Cys Gly Phe Cys Leu Pro Asp Trp
            755   760   765

Met Asn His Ser Val Leu Lys Asn Val Val Ser Ile Leu Ile Ser Gly
    770   775   780

Cys Glu Asn Cys Ser Cys Leu Pro Pro Phe Gly Glu Leu Pro Cys Leu
785   790   795   800

Glu Ser Leu Glu Leu Gln Asp Gly Ser Val Glu Val Glu Phe Val Glu
            805   810   815

Asp Ser Gly Phe Pro Thr Arg Arg Arg Phe Pro Ser Leu Arg Lys Leu
            820   825   830

His Ile Gly Gly Phe Cys Asn Leu Lys Gly Leu Gln Arg Met Glu Gly
            835   840   845

Glu Glu Gln Phe Pro Val Leu Glu Glu Met Lys Ile Ser Asp Cys Pro
    850   855   860

Met Phe Val Phe Pro Thr Leu Ser Ser Val Lys Lys Leu Glu Ile Trp
865   870   875   880

Gly Glu Ala Asp Ala Arg Gly Leu Ser Ser Ile Ser Asn Leu Ser Thr
            885   890   895

Leu Thr Ser Leu Lys Ile Phe Ser Asn His Thr Val Thr Ser Leu Leu
            900   905   910

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Glu Glu Met Phe Lys Ser Leu Glu Asn Leu Lys Tyr Leu Ser Val Ser
        915              920              925

Tyr Leu Glu Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala Ser Leu Asn
    930              935              940

Asn Leu Lys Cys Leu Asp Ile Arg Tyr Cys Tyr Ala Leu Glu Ser Leu
945              950              955              960

Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu Leu Phe Val
            965              970              975

Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu Gln His Leu
        980              985              990

Thr Thr Leu Thr Ser Leu Lys Ile  Arg Gly Cys Pro Gln  Leu Ile Lys
        995              1000             1005

Arg Cys  Glu Lys Gly Ile Gly  Glu Asp Trp His Lys  Ile Ser His
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Ile Pro  Asn Val Asn Ile Tyr  Ile
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1               5                   10                  15

atc gga gat aaa ctt gta ttg att ttc ggt ttc gaa aag gaa tgt gaa      96
Ile Gly Asp Lys Leu Val Leu Ile Phe Gly Phe Glu Lys Glu Cys Glu
                20                  25                  30

aag ctg tcg agt gtg ttt tcc aca att caa gct gtg gtt caa gat gct     144
Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Val Gln Asp Ala
        35                  40                  45

cag gag aag caa ttg aag gac aag gca att gag aat tgg ttg cag aaa     192
Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys
    50                  55                  60

ctc aat tct gct gcc tat gaa gtt gat gat ata ttg ggc gaa tgt aaa     240
Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys
65                  70                  75                  80

aat gag gca ata aga ttt gag cag tct cga tta ggg ttt tat cac cca     288
Asn Glu Ala Ile Arg Phe Glu Gln Ser Arg Leu Gly Phe Tyr His Pro
                85                  90                  95

ggg att atc aat ttc cgt cac aaa att ggg aga agg atg aaa gag ata     336
Gly Ile Ile Asn Phe Arg His Lys Ile Gly Arg Arg Met Lys Glu Ile
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atg gag aaa cta gat gca att gct gag gaa aga agg aag ttt cat ttc      384
Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg Arg Lys Phe His Phe
        115                 120                 125

ctt gaa aaa att acg gag aga caa gct gcc gct gct acg cgt gaa aca      432
Leu Glu Lys Ile Thr Glu Arg Gln Ala Ala Ala Ala Thr Arg Glu Thr
    130                 135                 140

ggt ttt gtg tta act gaa cca aaa gtc tac gga agg gac aaa gag gag      480
Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Asp Lys Glu Glu
145                 150                 155                 160

gat gag ata gtg aaa att ctg ata aac aat gtt aat gtt gcc gaa gaa      528
Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Asn Val Ala Glu Glu
                165                 170                 175

ctt cca gtc ttc cct ata att ggt atg ggg gga cta gga aag acg aca      576
Leu Pro Val Phe Pro Ile Ile Gly Met Gly Gly Leu Gly Lys Thr Thr
            180                 185                 190

ctt gcc caa atg atc ttc aac gat gag aga gta act aag cat ttc aat      624
Leu Ala Gln Met Ile Phe Asn Asp Glu Arg Val Thr Lys His Phe Asn
        195                 200                 205

ccc aaa ata tgg gtt tgt gtc tca gat gat ttt gat gag aag agg tta      672
Pro Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu
    210                 215                 220

att aag aca att ata gga aat att gaa aga agt tct cct cat gtt gag      720
Ile Lys Thr Ile Ile Gly Asn Ile Glu Arg Ser Ser Pro His Val Glu
225                 230                 235                 240

gac ttg gct tca ttt cag aag aag ctc cag gag tta ttg aat gga aaa      768
Asp Leu Ala Ser Phe Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys
            245                 250                 255

cga tac ttg ctt gtc tta gat gat gtt tgg aat gat gat cta gaa aag      816
Arg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Asp Asp Leu Glu Lys
            260                 265                 270

tgg gct aag tta aga gca gtc tta act gtt gga gca aga ggt gct tct      864
Trp Ala Lys Leu Arg Ala Val Leu Thr Val Gly Ala Arg Gly Ala Ser
        275                 280                 285

att cta gct act act cgt ctt gaa aag gtt gga tca att atg gga acg      912
Ile Leu Ala Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr
        290                 295                 300

tcg caa cca tat cat ttg tca aat ttg tct cca cat gat agt tta ctt      960
Ser Gln Pro Tyr His Leu Ser Asn Leu Ser Pro His Asp Ser Leu Leu
305                 310                 315                 320

ttg ttt atg caa cgc gca ttt ggg caa caa aaa gaa gca aat cct aat     1008
Leu Phe Met Gln Arg Ala Phe Gly Gln Gln Lys Glu Ala Asn Pro Asn
            325                 330                 335

cta gtg gcc att gga aag gag att gtg aag aaa tgt ggt ggt gtg cct     1056
Leu Val Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro
            340                 345                 350

tta gcg gcc aag act ctt ggt ggt ctt tta cgc ttc aag aga gaa gag     1104
Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu
        355                 360                 365

agt gaa tgg gaa cat gtg aga gat aat gag att tgg agt ctg cct caa     1152
Ser Glu Trp Glu His Val Arg Asp Asn Glu Ile Trp Ser Leu Pro Gln
        370                 375                 380
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gat gaa agt tct att ttg cct gct cta aga ctg agt tat cat cac ctt     1200
Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu
385             390             395             400

cca ctt gat ttg aga caa tgc ttt gcg tat tgt gca gta ttc cca aag     1248
Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys
                405             410             415

gac acc aaa atg ata aag gaa aat ctc att act ctc tgg atg gcg cat     1296
Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His
            420             425             430

ggt ttt ctt tta tca aag gga aac ttg gag cta gag gat gtg ggt aat     1344
Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn
            435             440             445

gaa gta tgg aat gaa tta tac ttg agg tct ttc ttc caa gaa att gaa     1392
Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu
        450             455             460

gct aaa tcg ggt aat act tat ttc aag ata cat gat cta atc cat gat     1440
Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp
465             470             475             480

ttg gct aca tct ctg ttt tcg gca agc gca tca tgc ggc aat atc cgc     1488
Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg
                485             490             495

gaa ata aat gtc aaa gat tat aag cat aca gtg tcc att ggt ttc tct     1536
Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ser
                500             505             510

gca gtg gtg tct tct tac tct cct tcg ctc ttg aaa aag ttt gtc tcg     1584
Ala Val Val Ser Ser Tyr Ser Pro Ser Leu Leu Lys Lys Phe Val Ser
            515             520             525

tta agg gtg ctt aat cta agt tac tca aaa ctt gag caa tta ccg tct     1632
Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser
        530             535             540

tcc att gga gat cta tta cat tta aga tac ctg gac ctg tct tgc aat     1680
Ser Ile Gly Asp Leu Leu His Leu Arg Tyr Leu Asp Leu Ser Cys Asn
545             550             555             560

aac ttc cgt agt ctt cca gag agg ttg tgc aag ctt caa aat ctt cag     1728
Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln
                565             570             575

act ctt gat gta cat aat tgc tac tca ctt aat tgt ttg cca aaa caa     1776
Thr Leu Asp Val His Asn Cys Tyr Ser Leu Asn Cys Leu Pro Lys Gln
                580             585             590

aca agt aaa ctt agt agt ctc cga cat ctt gtt gtt gat ggc tgt cca     1824
Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro
            595             600             605

ttg act tct act cca cca agg ata gga ttg ttg aca tgc ctt aag act     1872
Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr
            610             615             620

cta ggt ttc ttt att gtg gga agc aag aaa ggt tat caa ctt ggt gaa     1920
Leu Gly Phe Phe Ile Val Gly Ser Lys Lys Gly Tyr Gln Leu Gly Glu
625             630             635             640

ctg aaa aac cta aat ctc tgc ggc tca att tca atc aca cac ctt gag     1968
Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu
            645             650             655

aga gtg aag aac gat acg gat gca gaa gcc aat tta tct gca aaa gca     2016
Arg Val Lys Asn Asp Thr Asp Ala Glu Ala Asn Leu Ser Ala Lys Ala
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              660                    665                    670

aat ctg caa tct tta agc atg agt tgg gat aac gat gga cca aac aga    2064
Asn Leu Gln Ser Leu Ser Met Ser Trp Asp Asn Asp Gly Pro Asn Arg
        675                    680                    685

tat gaa tcc gaa gaa gtt aaa gtg ctt gaa gca ctc aaa cca cac ccc    2112
Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro
        690                    695                    700

aat ctg aaa tat tta gag atc att gcc ttc gga gga ttc cgt ttt cca    2160
Asn Leu Lys Tyr Leu Glu Ile Ile Ala Phe Gly Gly Phe Arg Phe Pro
705                    710                    715                    720

agc tgg ata aat cac tca gtt ttg gag aag gtc atc tct gtt aga att    2208
Ser Trp Ile Asn His Ser Val Leu Glu Lys Val Ile Ser Val Arg Ile
                725                    730                    735

aaa agc tgc aaa aac tgc ttg tgc tta cca ccc ttt ggg gag ctt cct    2256
Lys Ser Cys Lys Asn Cys Leu Cys Leu Pro Pro Phe Gly Glu Leu Pro
                740                    745                    750

tgt cta gaa aat cta gag tta caa aac gga tct gcg gag gtg gag tat    2304
Cys Leu Glu Asn Leu Glu Leu Gln Asn Gly Ser Ala Glu Val Glu Tyr
                755                    760                    765

gtt gaa gag gat gat gtc cat tct aga ttc tcc aca aga aga agc ttt    2352
Val Glu Glu Asp Asp Val His Ser Arg Phe Ser Thr Arg Arg Ser Phe
        770                    775                    780

cca tcc ctg aaa aaa ctt cgt ata tgg ttc ttt cgc agt ttg aaa ggg    2400
Pro Ser Leu Lys Lys Leu Arg Ile Trp Phe Phe Arg Ser Leu Lys Gly
785                    790                    795                    800

ctg atg aaa gag gaa gga gaa gag aaa ttc ccc atg ctt gaa gag atg    2448
Leu Met Lys Glu Glu Gly Glu Glu Lys Phe Pro Met Leu Glu Glu Met
                805                    810                    815

gcg att tta tat tgc cct ctg ttt gtt ttt cca acc ctt tct tct gtc    2496
Ala Ile Leu Tyr Cys Pro Leu Phe Val Phe Pro Thr Leu Ser Ser Val
                820                    825                    830

aag aaa tta gaa gtt cac ggc aac aca aac act aga ggt ttg agc tcc    2544
Lys Lys Leu Glu Val His Gly Asn Thr Asn Thr Arg Gly Leu Ser Ser
                835                    840                    845

ata tct aat ctt agc act ctt act tcc ctc cgc att ggt gct aac tac    2592
Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Arg Ile Gly Ala Asn Tyr
        850                    855                    860

aga gcg act tca ctc cca gaa gag atg ttc aca agt ctt aca aat ctc    2640
Arg Ala Thr Ser Leu Pro Glu Glu Met Phe Thr Ser Leu Thr Asn Leu
865                    870                    875                    880

gaa ttc ttg agt ttc ttt gac ttc aag aat ctc aaa gat ctg cct acc    2688
Glu Phe Leu Ser Phe Phe Asp Phe Lys Asn Leu Lys Asp Leu Pro Thr
                885                    890                    895

agc ctg act agt ctc aat gct ttg aag cgt ctc caa att gaa agt tgt    2736
Ser Leu Thr Ser Leu Asn Ala Leu Lys Arg Leu Gln Ile Glu Ser Cys
                900                    905                    910

gac tca cta gag agt ttc cct gaa caa ggg cta gaa ggt tta act tca    2784
Asp Ser Leu Glu Ser Phe Pro Glu Gln Gly Leu Glu Gly Leu Thr Ser
                915                    920                    925

ctc aca cag ttg ttt gtt aaa tac tgt aag atg cta aaa tgt tta ccc    2832
Leu Thr Gln Leu Phe Val Lys Tyr Cys Lys Met Leu Lys Cys Leu Pro
        930                    935                    940
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gag gga ttg cag cac cta aca gcc ctc aca aat tta gga gtt tct ggt    2880
Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly
945                 950                 955                 960


tgt cca gaa gtg gaa aag cgc tgt gat aag gaa ata gga gaa gac tgg    2928
Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp
                965                 970                 975


cac aaa att gct cac att cca aat ctg gat att cat tag                2967
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Lys Leu Ser Ser Val Phe Ser Thr Ile Gln Ala Val Val Gln Asp Ala
        35                  40                  45


Gln Glu Lys Gln Leu Lys Asp Lys Ala Ile Glu Asn Trp Leu Gln Lys
    50                  55                  60


Leu Asn Ser Ala Ala Tyr Glu Val Asp Asp Ile Leu Gly Glu Cys Lys
65                  70                  75                  80


Asn Glu Ala Ile Arg Phe Glu Gln Ser Arg Leu Gly Phe Tyr His Pro
                85                  90                  95


Gly Ile Ile Asn Phe Arg His Lys Ile Gly Arg Arg Met Lys Glu Ile
            100                 105                 110


Met Glu Lys Leu Asp Ala Ile Ala Glu Glu Arg Arg Lys Phe His Phe
        115                 120                 125


Leu Glu Lys Ile Thr Glu Arg Gln Ala Ala Ala Thr Arg Glu Thr
    130                 135                 140


Gly Phe Val Leu Thr Glu Pro Lys Val Tyr Gly Arg Asp Lys Glu Glu
145                 150                 155                 160


Asp Glu Ile Val Lys Ile Leu Ile Asn Asn Val Asn Val Ala Glu Glu
                165                 170                 175


Leu Pro Val Phe Pro Ile Ile Gly Met Gly Gly Leu Gly Lys Thr Thr
            180                 185                 190


Leu Ala Gln Met Ile Phe Asn Asp Glu Arg Val Thr Lys His Phe Asn
        195                 200                 205
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Pro Lys Ile Trp Val Cys Val Ser Asp Asp Phe Asp Glu Lys Arg Leu
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Ile Lys Thr Ile Ile Gly Asn Ile Glu Arg Ser Ser Pro His Val Glu
225             230             235                 240

Asp Leu Ala Ser Phe Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys
                245             250                 255

Arg Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Asp Asp Leu Glu Lys
            260             265                 270

Trp Ala Lys Leu Arg Ala Val Leu Thr Val Gly Ala Arg Gly Ala Ser
        275             280             285

Ile Leu Ala Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr
    290             295             300

Ser Gln Pro Tyr His Leu Ser Asn Leu Ser Pro His Asp Ser Leu Leu
305             310             315                 320

Leu Phe Met Gln Arg Ala Phe Gly Gln Gln Lys Glu Ala Asn Pro Asn
            325             330                 335

Leu Val Ala Ile Gly Lys Glu Ile Val Lys Lys Cys Gly Gly Val Pro
            340             345             350

Leu Ala Ala Lys Thr Leu Gly Gly Leu Leu Arg Phe Lys Arg Glu Glu
            355             360             365

Ser Glu Trp Glu His Val Arg Asp Asn Glu Ile Trp Ser Leu Pro Gln
    370             375             380

Asp Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His His Leu
385             390             395                 400

Pro Leu Asp Leu Arg Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys
            405             410             415

Asp Thr Lys Met Ile Lys Glu Asn Leu Ile Thr Leu Trp Met Ala His
            420             425             430

Gly Phe Leu Leu Ser Lys Gly Asn Leu Glu Leu Glu Asp Val Gly Asn
        435             440             445

Glu Val Trp Asn Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu
    450             455             460

Ala Lys Ser Gly Asn Thr Tyr Phe Lys Ile His Asp Leu Ile His Asp
465             470             475                 480
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Leu Ala Thr Ser Leu Phe Ser Ala Ser Ala Ser Cys Gly Asn Ile Arg
             485   490   495

Glu Ile Asn Val Lys Asp Tyr Lys His Thr Val Ser Ile Gly Phe Ser
             500   505   510

Ala Val Val Ser Ser Tyr Ser Pro Ser Leu Leu Lys Lys Phe Val Ser
             515   520   525

Leu Arg Val Leu Asn Leu Ser Tyr Ser Lys Leu Glu Gln Leu Pro Ser
     530   535   540

Ser Ile Gly Asp Leu Leu His Leu Arg Tyr Leu Asp Leu Ser Cys Asn
545   550   555   560

Asn Phe Arg Ser Leu Pro Glu Arg Leu Cys Lys Leu Gln Asn Leu Gln
             565   570   575

Thr Leu Asp Val His Asn Cys Tyr Ser Leu Asn Cys Leu Pro Lys Gln
             580   585   590

Thr Ser Lys Leu Ser Ser Leu Arg His Leu Val Val Asp Gly Cys Pro
     595   600   605

Leu Thr Ser Thr Pro Pro Arg Ile Gly Leu Leu Thr Cys Leu Lys Thr
     610   615   620

Leu Gly Phe Phe Ile Val Gly Ser Lys Lys Gly Tyr Gln Leu Gly Glu
625   630   635   640

Leu Lys Asn Leu Asn Leu Cys Gly Ser Ile Ser Ile Thr His Leu Glu
             645   650   655

Arg Val Lys Asn Asp Thr Asp Ala Glu Ala Asn Leu Ser Ala Lys Ala
             660   665   670

Asn Leu Gln Ser Leu Ser Met Ser Trp Asp Asn Asp Gly Pro Asn Arg
     675   680   685

Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His Pro
     690   695   700

Asn Leu Lys Tyr Leu Glu Ile Ile Ala Phe Gly Gly Phe Arg Phe Pro
705   710   715   720

Ser Trp Ile Asn His Ser Val Leu Glu Lys Val Ile Ser Val Arg Ile
             725   730   735

Lys Ser Cys Lys Asn Cys Leu Cys Leu Pro Pro Phe Gly Glu Leu Pro
             740   745   750

Cys Leu Glu Asn Leu Glu Leu Gln Asn Gly Ser Ala Glu Val Glu Tyr
     755   760   765

Val Glu Glu Asp Asp Val His Ser Arg Phe Ser Thr Arg Arg Ser Phe
    770   775   780

Pro Ser Leu Lys Lys Leu Arg Ile Trp Phe Phe Arg Ser Leu Lys Gly
785   790   795   800

Leu Met Lys Glu Glu Gly Glu Glu Lys Phe Pro Met Leu Glu Glu Met
                805   810   815

Ala Ile Leu Tyr Cys Pro Leu Phe Val Phe Pro Thr Leu Ser Ser Val
                820   825   830

Lys Lys Leu Glu Val His Gly Asn Thr Asn Thr Arg Gly Leu Ser Ser   .
        835   840   845

Ile Ser Asn Leu Ser Thr Leu Thr Ser Leu Arg Ile Gly Ala Asn Tyr
    850   855   860

Arg Ala Thr Ser Leu Pro Glu Glu Met Phe Thr Ser Leu Thr Asn Leu
865   870   875   880

Glu Phe Leu Ser Phe Phe Asp Phe Lys Asn Leu Lys Asp Leu Pro Thr
                885   890   895

Ser Leu Thr Ser Leu Asn Ala Leu Lys Arg Leu Gln Ile Glu Ser Cys
                900   905   910

Asp Ser Leu Glu Ser Phe Pro Glu Gln Gly Leu Glu Gly Leu Thr Ser
        915   920   925

Leu Thr Gln Leu Phe Val Lys Tyr Cys Lys Met Leu Lys Cys Leu Pro
    930   935   940

Glu Gly Leu Gln His Leu Thr Ala Leu Thr Asn Leu Gly Val Ser Gly
945   950   955   960

Cys Pro Glu Val Glu Lys Arg Cys Asp Lys Glu Ile Gly Glu Asp Trp
                965   970   975

His Lys Ile Ala His Ile Pro Asn Leu Asp Ile His
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agaggaagat gatgaagtga aatgacgtgg tggtgggtcc atgtgacata aaaaaaaatt      240

ctcttaaata atcctttcat actaatgata aaattttttt ttttttttt ttttactaa        300

ttgcgtatag agaaaaggaa aatggggcgg taattacaaa gtagggaatc gaactttatc      360

aacaagttga gagttcaagt aatcaaccaa ctaaactact aaaattttc taattaatga       420

taattgtaat tcatttagca taaaaaattt cattgcactt acttttagag ttttgaaaac      480

agtacttcat ctattctata ttaattaaat tttctatatt aattaaattt gtgaggtaat      540

acaaacttat taagaaaaat atttaaggac ataatttaac tcatattttt cactattgtt      600

ttttgtgaaa tcataaatat aactttgtaa atagtgcaat ttatctccta gaagcaaatt      660

tcaccaaaga aaagggcaaa gatggaaaag aaactaaata ttcatcttaa actttgaaca      720

attcaattat tttgaacaat gaaaaaaatc tcaaaaattc aattaatatg aaatggagag      780

agtaacttta ttttagaggc aaaaaattag tactccatcc gttcactttt atttgtcatg      840

ttgcgctttt cgaaagtcaa tttgactaat ttttaaagct aaattagatt acactaattc      900

aatattttaa acagaaaat tagatattca aaaactatac aaaaaatatt atacattgca        960

attttttgca tatcaatatg ataaaaaaat atattgtaaa atattagtca aaattttat       1020

agtttgactc taatcatgaa aagtataata attaatagtg gacggaggaa gtattgtctt     1080

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ctgtctcata ttagatgggc atcttactaa aaatatttgt ctcatattac ttgattattt     1200

attaaatcaa aaagaattaa ttaattttttt ctcattttac ccctacaatt aatatagttt    1260

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aaaatagaat atgtttatct aatatgagac ggagaaaata tatcctaaaa tattttggga    1440

cagatatgtg atattctaac cattcactag actatattat gcatttagc cgccaatgac      1500

ttatttcagc tttaattaat taggaaagag gaaactgcca atgaggaaga gtaggggcgt     1560

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acaatttaat agggattatt ttgtaaaata tttatatgaa taattgtttt cgtaatgaat    1740

ttgtccggtc aaacaatgat aaataaaaat gaatgaagag agtagaaaac aaaacaaaag    1800

aacaagttga caacttgaga gattaaaagg gtccaaaacg ccttggattt tgagattcca     1860

tatgtgaaat ttccatgaaa taattgaatt tgtattatta caagtcaaac tttccatttc     1920

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Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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1                   5


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